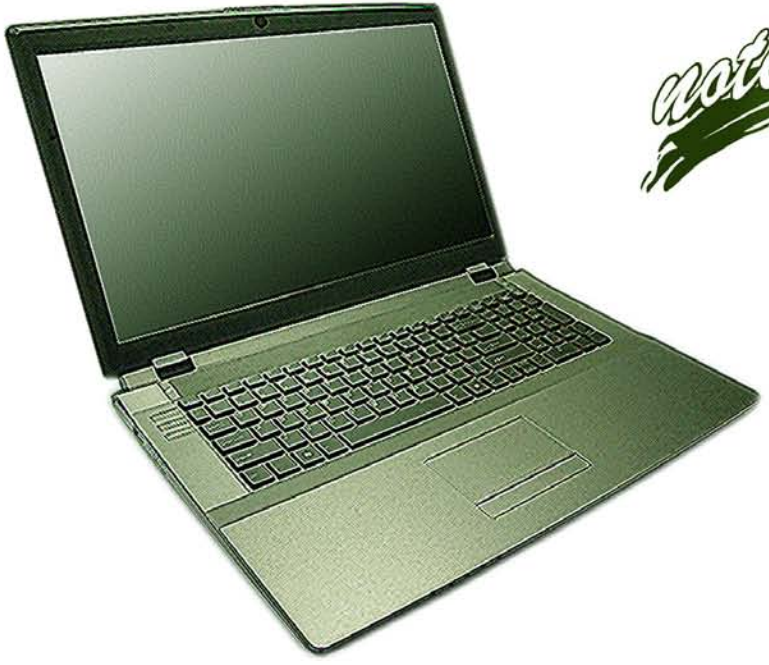
USER'S MANUAL

notebook



V12.1.00

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R&TTE Directive

This device is in compliance with the essential requirements and other relevant provisions of the R&TTE Directive 1999/5/EC.

This device will be sold in the following EEA countries: Austria, Italy, Belgium, Liechtenstein, Denmark, Luxembourg, Finland, Netherlands, France, Norway, Germany, Portugal, Greece, Spain, Iceland, Sweden, Ireland, United Kingdom, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Slovakia, Poland, Slovenia.

EuP-Standby and Off Mode Power Consumption Statement:

The figures below note the power consumption of this computer in compliance with European Commission (EC) regulations on power consumption in off mode or standby mode:

- Standby Mode < 2W
- Off Mode < 1W

CE Marking

This device has been tested to and conforms to the regulatory requirements of the European Union and has attained CE Marking. The CE Mark is a conformity marking consisting of the letters “CE”. The CE Mark applies to products regulated by certain European health, safety and environmental protection legislation. The CE Mark is obligatory for products it applies to: the manufacturer affixes the marking in order to be allowed to sell his product in the European market.

This product conforms to the essential requirements of the R&TTE directive 1999/5/EC in order to attain CE Marking. A notified body has determined that this device has properly demonstrated that the requirements of the directive have been met and has issued a favorable certificate of expert opinion. As such the device will bear the notified body number 0560 after the CE mark.

The CE Marking is not a quality mark. Foremost, it refers to the safety rather than to the quality of a product. Secondly, CE Marking is mandatory for the product it applies to, whereas most quality markings are voluntary.

FCC Statement
(Federal Communications Commission)

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the service representative or an experienced radio/TV technician for help.

Operation is subject to the following two conditions:

1. This device may not cause interference.

   And

2. This device must accept any interference, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.



Warning

Use only shielded cables to connect I/O devices to this equipment. You are cautioned that changes or modifications not expressly approved by the manufacturer for compliance with the above standards could void your authority to operate the equipment.

IMPORTANT SAFETY INSTRUCTIONS

Follow basic safety precautions, including those listed below, to reduce the risk of fire, electric shock, and injury to persons when using any electrical equipment:

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using this equipment with a telephone line (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit:

- Full Range AC/DC Adapter - AC Input 100 - 240V, 50 - 60Hz, DC Output 19V, 6.3A (**120W**) minimum.

This Computer's Optical Device is a Laser Class 1 Product

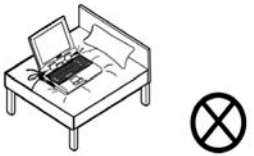
Instructions for Care and Operation

The notebook computer is quite rugged, but it can be damaged. To prevent this, follow these suggestions:

1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

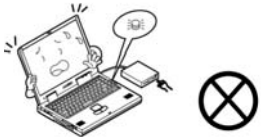
Do not expose the computer to any shock or vibration.	*Do not place it on an unstable surface.*	*Do not place anything heavy on the computer.*
		

2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

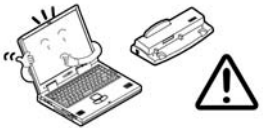
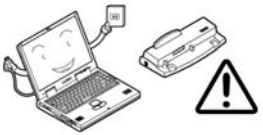
Do not expose it to excessive heat or direct sunlight.	*Do not leave it in a place where foreign matter or moisture may affect the system.*	*Don't use or store the computer in a humid environment.*	*Do not place the computer on any surface that will block the Vents/Fan Intakes.*
			

3. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.

4. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.

Do not turn off the power until you properly shut down all programs.	*Do not turn off any peripheral devices when the computer is on.*	*Do not disassemble the computer by yourself.*	*Perform routine maintenance on your computer.*
			

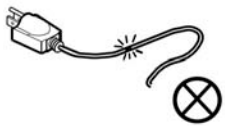
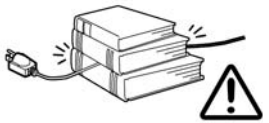
5. **Take care when using peripheral devices**.

Use only approved brands of peripherals.	*Unplug the power cord before attaching peripheral devices.*
	

Power Safety

The computer has specific power requirements:

- Only use a power adapter approved for use with this computer.
- Your AC/DC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your service representative or local power company.
- The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
- When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
- Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the computer, make sure it is disconnected from any external power supplies (i.e. AC/DC adapter or car adapter).

Do not plug in the power cord if you are wet.	*Do not use the power cord if it is broken.*	*Do not place heavy objects on the power cord.*
		

Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord).

You must also remove your battery in order to prevent accidentally turning the machine on. **Before removing the battery disconnect the AC/DC adapter from the computer.**

Polymer Battery Precautions

Note the following information which is specific to polymer batteries only, and where applicable, this overrides the general battery precaution information overleaf.

- Polymer batteries may experience a slight expansion or swelling, however this is part of the battery's safety mechanism and is not a cause for concern.
- Use proper handling procedures when using polymer batteries. Do not use polymer batteries in high ambient temperature environments, and do not store unused batteries for extended periods.

See also the general battery precautionary information overleaf for further information.

General Battery Precautions

- Only use batteries designed for this computer. The wrong battery type may explode, leak or damage the computer.
- Do not remove any batteries from the computer while it is powered on.
- Do not continue to use a battery that has been dropped, or that appears damaged (e.g. bent or twisted) in any way. Even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire.
- If you do not use the battery for an extended period, then remove the battery from the computer for storage.
- Recharge the batteries using the notebook's system. Incorrect recharging may make the battery explode.
- Do not try to repair a battery pack. Refer any battery pack repair or replacement to your service representative or qualified service personnel.
- Keep children away from, and promptly dispose of a damaged battery. Always dispose of batteries carefully. Batteries may explode or leak if exposed to fire, or improperly handled or discarded.
- Keep the battery away from metal appliances.
- Affix tape to the battery contacts before disposing of the battery.
- Do not touch the battery contacts with your hands or metal objects.



Battery Disposal & Caution

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer's instructions.

Cleaning

Do not apply cleaner directly to the computer; use a soft clean cloth.
Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

Servicing

Do not attempt to service the computer yourself. Doing so may violate your warranty and expose you and the computer to electric shock. Refer all servicing to authorized service personnel. Unplug the computer from the power supply. Then refer servicing to qualified service personnel under any of the following conditions:

- When the power cord or AC/DC adapter is damaged or frayed.
- If the computer has been exposed to rain or other liquids.
- If the computer does not work normally when you follow the operating instructions.
- If the computer has been dropped or damaged (do not touch the poisonous liquid if the LCD panel breaks).
- If there is an unusual odor, heat or smoke coming from your computer.

Removal Warning

When removing any cover(s) and screw(s) for the purposes of device upgrade, remember to replace the cover(s) and screw(s) before restoring power to the system.

Also note the following when the cover is removed:

- Hazardous moving parts.
- Keep away from moving fan blades.

Travel Considerations

Packing

As you get ready for your trip, run through this list to make sure the system is ready to go:

1. Check that the battery pack and any spares are fully charged.
2. Power off the computer and peripherals.
3. Close the display panel and make sure it's latched.
4. Disconnect the AC/DC adapter and cables. Stow them in the carrying bag.
5. The AC/DC adapter uses voltages from 100 to 240 volts so you won't need a second voltage adapter. However, check with your travel agent to see if you need any socket adapters.
6. Put the notebook in its carrying bag and secure it with the bag's straps.
7. If you're taking any peripherals (e.g. a printer, mouse or digital camera), pack them and those devices' adapters and/or cables.
8. Anticipate customs - Some jurisdictions may have import restrictions or require proof of ownership for both hardware and software. Make sure your "papers" are handy.



Power Off Before Traveling

Make sure that your notebook is completely powered off before putting it into a travel bag (or any such container). Putting a notebook which is powered on in a travel bag may cause the Vents/Fan Intakes to be blocked. To prevent your computer from overheating make sure nothing blocks the Vent/Fan Intakes while the computer is in use.

On the Road

In addition to the general safety and maintenance suggestions in this preface, and Chapter 8: Troubleshooting, keep these points in mind:

Hand-carry the notebook - For security, don't let it out of your sight. In some areas, computer theft is very common. Don't check it with "normal" luggage. Baggage handlers may not be sufficiently careful. Avoid knocking the computer against hard objects.

Beware of Electromagnetic fields - Devices such as metal detectors & X-ray machines can damage the computer, hard disk, floppy disks, and other media. They may also destroy any stored data - Pass your computer and disks around the devices. Ask security officials to hand-inspect them (you may be asked to turn it on). **Note**: Some airports also scan luggage with these devices.

Fly safely - Most airlines have regulations about the use of computers and other electronic devices in flight. These restrictions are for your safety, follow them. If you stow the notebook in an overhead compartment, make sure it's secure. Contents may shift and/or fall out when the compartment is opened.

Get power where you can - If an electrical outlet is available, use the AC/DC adapter and keep your battery(ies) charged.

Keep it dry - If you move quickly from a cold to a warm location, water vapor can condense inside the computer. Wait a few minutes before turning it on so that any moisture can evaporate.

Developing Good Work Habits

Developing good work habits is important if you need to work in front of the computer for long periods of time. Improper work habits can result in discomfort or serious injury from repetitive strain to your hands, wrists or other joints. The following are some tips to reduce the strain:



- Adjust the height of the chair and/or desk so that the keyboard is at or slightly below the level of your elbow. Keep your forearms, wrists, and hands in a relaxed position.
- Your knees should be slightly higher than your hips. Place your feet flat on the floor or on a footrest if necessary.
- Use a chair with a back and adjust it to support your lower back comfortably.
- Sit straight so that your knees, hips and elbows form approximately 90-degree angles when you are working.
- Take periodic breaks if you are using the computer for long periods of time.



Remember to:

- Alter your posture frequently.
- Stretch and exercise your body several times a day.
- Take periodic breaks when you work at the computer for long periods of time. Frequent and short breaks are better than fewer and longer breaks.

Lighting

Proper lighting and a comfortable viewing angle can reduce eye strain and shoulder and neck muscle fatigue.

- Position the display to avoid glare or reflections from overhead lighting or outside sources of light.
- Keep the display screen clean and set the brightness and contrast to levels that allow you to see the screen clearly.
- Position the display directly in front of you at a comfortable viewing distance.
- Adjust the display-viewing angle to find the best position.

LCD Screen Care

To prevent **image persistence** on LCD monitors (caused by the continuous display of graphics on the screen for an extended period of time) take the following precautions:

- Set the *Windows* **Power Plans** to turn the screen off after a few minutes of screen idle time.
- Use a rotating, moving or blank screen saver (this prevents an image from being displayed too long).
- Rotate desktop background images every few days.
- Turn the monitor off when the system is not in use.

LCD Electro-Plated Logos

Note that in computers featuring a raised LCD electro-plated logo, the logo is covered by a protective adhesive. Due to general wear and tear, this adhesive may deteriorate over time and the exposed logo may develop sharp edges. Be careful when handling the computer in this case, and avoid touching the raised LCD electro-plated logo. Avoid placing any other items in the carrying bag which may rub against the top of the computer during transport. If any such wear and tear develops contact your service center.

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Chapter 1: Quick Start Guide

Overview

This Quick Start Guide is a brief introduction to the basic features of your computer, to navigating around the computer and to getting your system started. The remainder of the manual covers the following:

- **Chapter 2** A guide to using some of the main features of the computer e.g. the **storage devices** (**hard disk**, **optical device**, **card reader**)**, TouchPad** & **Mouse** & **Audio Features**.
- **Chapter 3** The computer's **power** management options.
- **Chapter 4** The installation of the **drivers** and utilities essential to the operation or improvement of some of the computer's subsystems.
- **Chapter 5** An outline of the computer's built-in software or **BIOS** (Basic Input Output System).
- **Chapter 6** Instructions for **upgrading** your computer.
- **Chapter 7** A quick guide to the computer's **PC Camera, Wireless LAN, Wireless Display, Fingerprint, Bluetooth & WLAN Combo** and **TruStudio Audio** modules (some of which may be **optional** depending on your purchase configuration).
- **Chapter 8** A **troubleshooting** guide.
- **Appendix A** Definitions of the **interface**, **ports**/**jacks** which allow your computer to communicate with external devices.
- **Appendix B** Information on the **Control Center**.
- **Appendix C** Information on the **NVIDIA** Video driver controls.
- **Appendix D** The computer's **specification**.

Advanced Users

If you are an advanced user you may skip over most of this Quick Start Guide. However you may find it useful to refer to *"Drivers & Utilities" on page 4 - 1*, *"BIOS Utilities" on page 5 - 1* and *"Upgrading The Computer" on page 6 - 1* in the User's Manual. You may also find the notes marked with a of interest to you.

Notes

Check the light colored boxes with the mark above to find detailed information about the computer's features.

Beginners and Not-So-Advanced Users

If you are new to computers (or do not have an advanced knowledge of them) then the information contained in this Quick Start Guide should be enough to get you up and running. Eventually you should try to look through all the documentation (more detailed descriptions of the functions, setup and system controls are covered in the remainder of the User's Manual), but do not worry if you do not understand everything the first time. Keep this manual nearby and refer to it to learn as you go. You may find it useful to refer to the notes marked with a as indicated in the margin. For a more detailed description of any of the interface ports and jacks see *"Interface (Ports & Jacks)" on page A - 1*.

Warning Boxes

No matter what your level please pay careful attention to the warning and safety information indicated by the symbol. Also please note the safety and handling instructions as indicated in the *Preface*.

Not Included

Operating Systems (e.g. *Windows 7*) and applications (e.g. word processing, spreadsheet and database programs) have their own manuals, so please consult the appropriate manuals.



Drivers

If you are installing new system software, or are re-configuring your computer for a different system, you will need to install the appropriate drivers. Drivers are programs which act as an interface between the computer and a hardware component e.g. a wireless network module. It is very important that you install the drivers in the order listed in ***Table 4 - 1, on page 4 - 3***. You will be unable to use most advanced controls until the necessary drivers and utilities are properly installed. If your system hasn't been properly configured (your service representative may have already done that for you), refer to ***"Drivers & Utilities" on page 4 - 1*** for installation instructions.

Ports and Jacks

See ***"Ports and Jacks" on page A - 2*** for a description of the interface (ports & jacks) which allow your computer to communicate with external devices, connect to the internet etc.

System Software

Your computer may already come with system software pre-installed. Where this is not the case, or where you are re-configuring your computer for a different system, you will find that this manual refers to the ***Windows 7*** operating system.



Windows OS

In order to run ***Windows 7*** without limitations or decreased performance, your computer requires a minimum **1GB** of system memory (RAM), however if you are running ***Windows 7 64 bit*** your computer requires a minimum **2GB** of system memory (RAM).

System Startup

1. Remove all packing materials and place the computer on a stable surface.
2. Securely attach any peripherals you want to use with the notebook (e.g. keyboard and mouse) to their ports.
3. Attach the AC/DC adapter to the DC-In jack at the rear of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter.
4. Use one hand to raise the lid/LCD to a comfortable viewing angle (**do not exceed 135 degrees**); use the other hand (as illustrated in ***Figure 1 - 1*** below) to support the base of the computer (**Note**: **Never** lift the computer by the lid/LCD).
5. Press the power button on the top right of the computer **for about 2 - 3** seconds to turn the computer "**on**" (note that the **power LED** on the front of the computer **will turn from orange to green** when the computer powers on).

Shutdown

Note that you should always shut your computer down by choosing the **Shut Down** command from the bottom right of the **Start** menu in ***Windows***. This will help prevent hard disk or system problems.

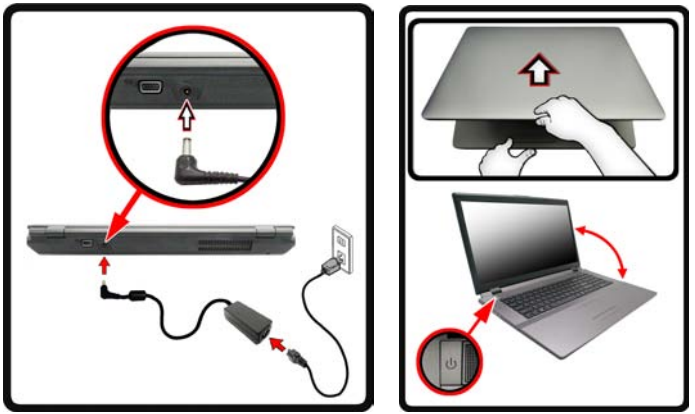


Figure 1 - 1 **- Opening the Lid/LCD & Computer with AC/DC Adapter Plugged-In**

System Map: LCD Panel Open

Figure 1 - 2
LCD Panel Open

1. Built-In PC Camera (**Optional**)
2. LCD
3. Power Button
4. GPU Button
5. Speakers
6. Top Case LED Indicators)
7. Hot Key Buttons
8. Keyboard
9. Built-In Microphone
10. Touchpad & Buttons





Wireless Device Operation Aboard Aircraft

The use of any portable electronic transmission devices aboard aircraft is usually prohibited. Make sure the module(s) are OFF if you are using the computer aboard aircraft.

Use the key combinations to toggle power to the **WLAN/ Bluetooth** modules, and check the LED indicator or on-screen icon to see if the modules are powered on or not (see ***Table 1 - 4, on page 1 - 11***/ ***Table 1 - 2, on page 1 - 8***).

LED Indicators

The LED indicators on the computer display helpful information about the current status of the computer.

Icon	Color	Description	Icon	Color	Description
	Orange	AC/DC Power is Plugged In		Green	Number Lock is Activated 
	Green	The Computer is On		Green	Caps Lock is Activated 
	Blinking Green	The Computer is in Sleep Mode		Green	Scroll Lock is Activated 
	Orange	The Battery is Charging			
	Green	The Battery is Fully Charged			
	Blinking Orange	The Battery Has Reached Critically Low Power Status			

Table 1 - 1 **- Front Left LED Indicators**

See overleaf for information on the Top Case LED indicators.

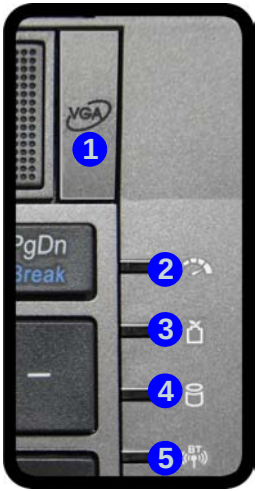
Icon	Color	Description	
1	Green	UMA Mode Activated (GPU Button)	
	Orange	Optimus Mode Activated (GPU Button)	
2	Orange	NVIDIA Discrete GPU (**dGPU**) Activated	
3	Green	Intel Integrated GPU (**iGPU**) Activated	
4	White	Hard Disk Activity	
5	Green	The (**optional**) WLAN Module is Powered On	
	Orange	The (**optional**) Bluetooth Module is Powered On	
	White	The Computer is Powered On	

Table 1 - 2 **- Top Case LED Indicators**

Hot Key Buttons & Keyboard

Press the hot key buttons on the computer to toggle the appropriate function on/off.

Icon	Color	Description
YGA	Green	UMA Mode Activated (GPU Button)
YGA	Orange	Optimus Mode Activated (GPU Button)
1		Power On/Off the (**optional**) PC Camera
2		Mute On/Off
3		Power On/Off the (**optional**) Wireless LAN Module
		Power the Computer On/Off

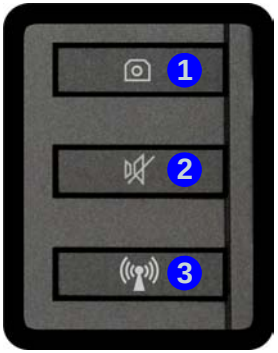


Table 1 - 3 **- Hot Key Buttons**

Special Characters

Some software applications allow the number-keys to be used with **Alt** to produce special characters. These special characters can only be produced by using the numeric keypad. Regular number keys (in the upper row of the keyboard) will not work. Make sure that **NumLk** is on.

Other Keyboards

If your keyboard is damaged or you just want to make a change, you can use any standard USB keyboard. The system will detect and enable it automatically. However special functions/hot-keys unique to the system's regular keyboard may not work.

NumLk & ScrLk

Hold down the **Fn Key** and either NumLk or ScrLk to enable number or scroll lock, and check the LED indicator for status.

Keyboard

The keyboard has an embedded numerical keypad for easy numeric data input, and features function keys to allow you to change operational features instantly. See *Table 1 - 4, on page 1 - 11* for full function key combination details.

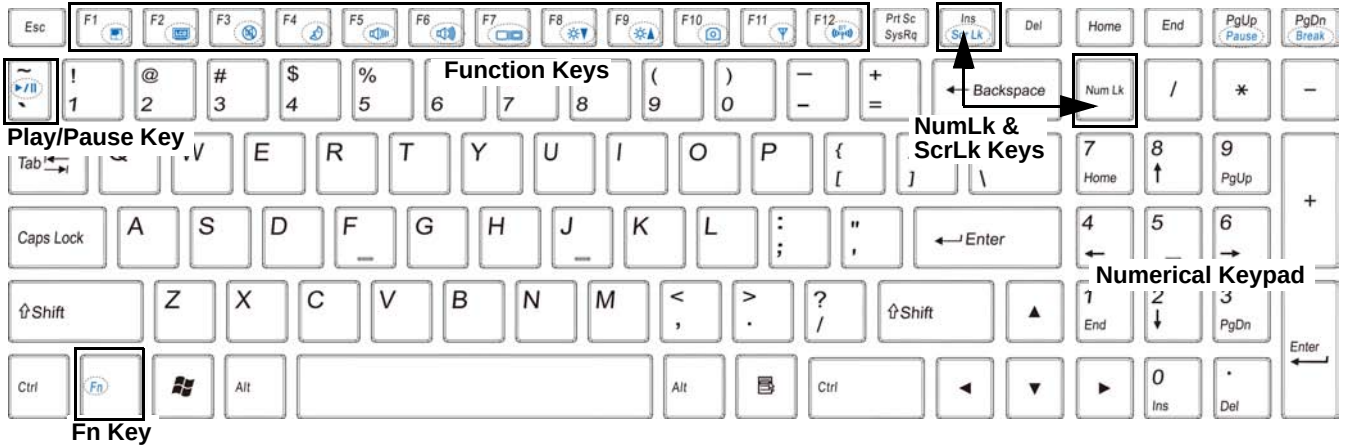


Figure 1 - 3 **- Keyboard**

Function Keys & Visual Indicators

The **function keys** (F1 - F12 etc.) will act as **hot keys** when pressed while the **Fn** key is held down. Visual indicators (see the table below) are available when the Hot Key driver is installed.

Keys	Function/Visual Indicators	Keys	Function/Visual Indicators
Fn + ~	Play/Pause (in Audio/Video Programs)	Fn + Esc	**Control Center** Toggle (see over)
Fn + F1	Touchpad Toggle  	Fn +F8/F9	Brightness Decrease/Increase 
Fn + F2	Turn LCD Backlight Off (Press a key to or use Touchpad to turn on)	Fn + F10	PC Camera Power Toggle  
Fn + F3	Mute Toggle 	Fn + F11	WLAN Power Toggle 
Fn + F4	Sleep Toggle	Fn + F12	Bluetooth Power Toggle 
Fn +F5/F6	Volume Decrease/Increase 		
Fn + F7	Display Toggle		
See also ***Table 1 - 1, on page 1 - 7*** for **Number Lock**, **Caps Lock** and **Scroll Lock** indicators			

Table 1 - 4 **- Function Keys & Visual Indicators**

Control Center

Press the **Fn + Esc** key combination, or **double-click the icon** in the **notification area of the taskbar** to toggle the **Control Center** on/off. The **Control Center** gives quick access to frequently used controls and enables you to quickly turn modules on/off.

Control Center

Click on any button to turn any of the **modules** (e.g. **TouchPad, Camera**) on/off.

Click on the power conservation modes to switch between **Performance**, **Balanced** or **Energy Star** modes (see page *3 - 10*). To remove the Power Conservation Modes screen just click in a blank area of the icon or press a key on the keyboard.

Click on the buttons (or just click and hold the mouse button) to adjust the slider for **Brightness/Volume**.

Click on **Display Switch** and click to choose a display mode from the menu (see page *C - 13*).



Table 1 - 5 **- Control Center**

System Map: Front & Left Views



Figure 1 - 4
Front & Left Views

1. LED Indicators
2. Security Lock Slot
3. USB 2.0 Port
4. S/PDIF-Out Jack
5. Microphone-In Jack
6. Headphone-Out Jack
7. Optical Device Drive Bay

CD/DVD Emergency Eject

If you need to manually eject a CD/DVD (e.g. due to an unexpected power interruption) you may push the end of a straightened paper clip into the emergency eject hole. Do not use a sharpened pencil or any object that may break and become lodged in the hole. Don't try to remove a floppy disk/CD/DVD while the system is accessing it. This may cause the system to "crash".

Disk Eject Warning

Don't try to eject a CD/DVD while the system is accessing it. This may cause the system to "crash". Stop the disk first then eject it, or press the stop button twice.

THX TruStudio Audio

Note that **you will need to install the THX TruStudio audio application in order to get maximum audio performance.**

System Map: Right & Rear Views

Figure 1 - 5
Right & Rear Views



1. Multi-In-1 Card Reader
2. 2 * USB 3.0 Ports
3. Combined eSATA/ USB 3.0 Port
4. HDMI-Out Port
5. RJ-45 LAN Jack
6. External Monitor Port
7. DC-In Jack
8. Vent/Fan Intake

USB 3.0 Ports

USB 3.0 ports are denoted by their blue color; USB 2.0 ports are colored black. Note that the USB 3.0 port requires a driver installation (see ***"USB 3.0" on page 4 - 7***) and is not operational under DOS.

Multi-In-1 Card Reader

The card reader allows you to use the most popular digital storage card formats:

MMC (MultiMedia Card) / RS MMC
SD (Secure Digital) / Mini SD / SDHC / SDXC
MS (Memory Stick) / MS Pro / MS Duo

The card reader features a push-in/push-out card insertion and ejection mechanism. Simply push the card to insert and eject it, however Ms Duo cards require an adapter.

HDMI Port

Note that the HDMI Port supports video and audio signals to attached external displays (also see ***"HDMI Audio Configuration" on page C - 22***). Note that THX TruStudio Pro will be disabled when you are connecting to an external display through an HDMI connection (see page ***7 - 57***).

System Map: Bottom View

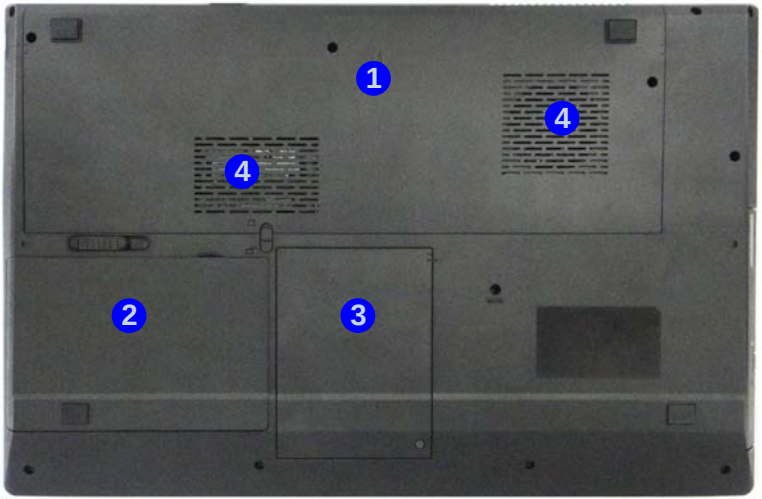


Figure 1 - 6
Bottom View

1. Component Bay Cover
2. Battery
3. Primary HDD Bay
4. Fan Outlet/Intake

CPU

The CPU is not a user serviceable part.

Overheating

To prevent your computer from overheating make sure nothing blocks the Vent/Fan Intake while the computer is in use.

Battery Information

Always completely discharge, then fully charge, a new battery before using it. Completely discharge and charge the battery at least once every 30 days or after about 20 partial discharges. See ***"Battery Information" on page 3 - 11*** for full instructions.

Windows 7 Start Menu & Control Panel

Most of the control panels, utilities and programs within ***Windows 7*** (and most other ***Windows*** versions) are accessed from the **Start** menu. When you install programs and utilities they will be installed on your hard disk drive, and a shortcut will usually be placed in the **Start** menu and/or the desktop. Right-click the **Start menu** icon , and then select **Properties** if you want to customize the appearance of the **Start** menu.

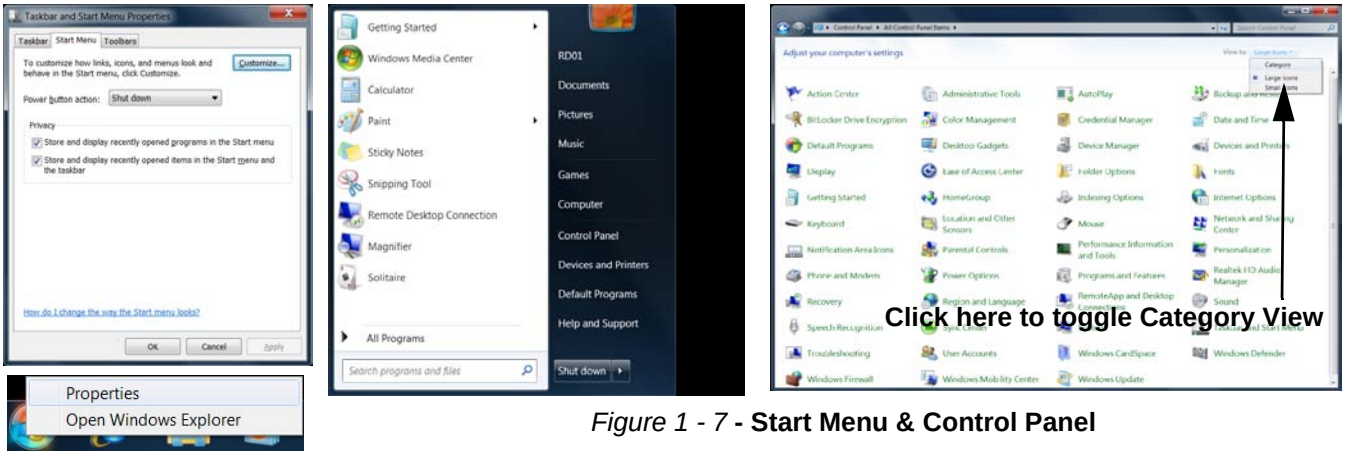


Figure 1 - 7 **- Start Menu & Control Panel**

In many instances throughout this manual you will see an instruction to open the **Control Panel**. The **Control Panel** is accessed from the **Start** menu, and it allows you to configure the settings for most of the key features in ***Windows*** (e.g. power, video, network, audio etc.). ***Windows 7*** provides basic controls for many of the features, however many new controls are added (or existing ones are enhanced) when you install the drivers. To see all controls it may be necessary to toggle off ***Category View*** to view the control panel icons.

Video Features

NVIDIA® Optimus™ Technology

NVIDIA® Optimus™ technology is a seamless technology designed to get best performance from the graphics system while allowing longer battery life, without having to manually change settings. When the computer is in **Optimus Mode** it will **automatically** switch between the integrated UMA (Unified Memory Architecture) GPU (**iGPU**) and the discrete GPU (**dGPU**) when required by the applications in use. This switch is seamless to the user and does not require any use of the GPU button (see ***"NVIDIA® Optimus™ Technology" on page C - 2***).

The **GPU button** allows you to switch between the **Optimus Mode** (where GPU switching is automatically handled) and **UMA Mode** (for constant power-saving with the integrated GPU only).

Icon	Color	Description	Note
	Green	UMA Mode Activated	The **GPU LED indicators** will display which GPU is currently in use
	Orange	Optimus Mode Activated	
	Green	Integrated GPU (**iGPU**) Activated	
	Orange	Discrete GPU (**dGPU**) Activated	

Table 1 - 6 **- GPU Modes & GPU LED Indicators**

You can switch display devices, and configure display options, from the **Display** control panel (in **Appearances and Personalization**) in ***Windows 7*** (see over). For more detailed video information see ***"Video Driver Controls" on page C - 1***.

Quick Start Guide

To access **Display (Control Panel) and Screen Resolution** in ***Windows***:

1. Click **Start** and click **Control Panel**.
2. Click **Display** (icon) - In the **Appearances and Personalization** category.
3. Click **Adjust Screen Resolution/Adjust resolution**.
4. Alternatively you can right-click the desktop and select **Screen resolution**.
5. Use the dropbox to select the screen **Resolution** 1 (***Figure 1 - 8***).
6. Click **Advanced settings** 2 (***Figure 1 - 8***) to bring up the **Advanced** properties tabs.

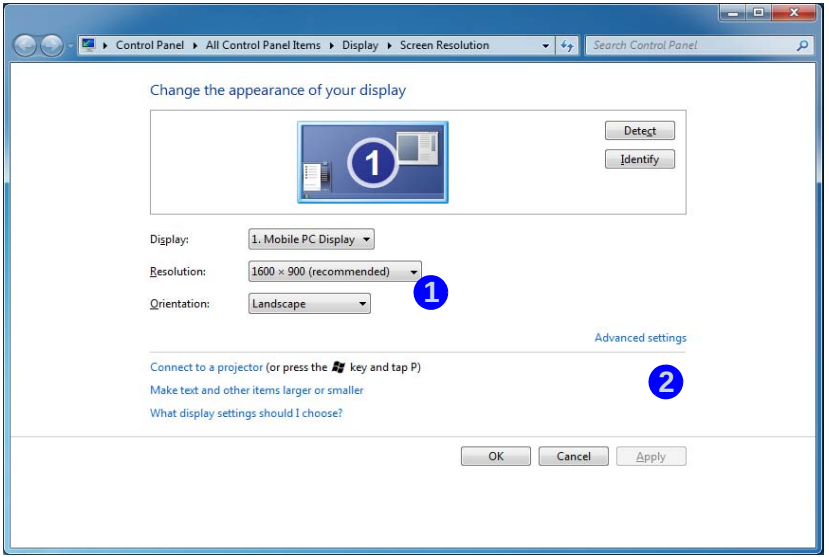


Figure 1 - 8 **- Screen Resolution**

To access the ***Intel(R) Graphics and Media Control Panel***:

1. Click **Advanced settings** 2 (***Figure 1 - 8 on page 1 - 18***) in the **Display Settings** control panel in ***Windows***.
2. Click **Graphics Properties (button)** 3 (***Figure 1 - 9***) in the **Intel Graphics & Media Control Panel** tab.

OR

3. Right-click the desktop and select **Graphics Properties** from the menu.

OR

4. Click the icon 4 (***Figure 1 - 9***) in the taskbar and select **Graphics Properties** from the menu.

OR

5. Access the **Intel(R) Graphics and Media Control Panel** from the ***Windows*** control panel in **Classic View.**
6. Choose the application mode (**Basic, Advanced or Wizard**) required.

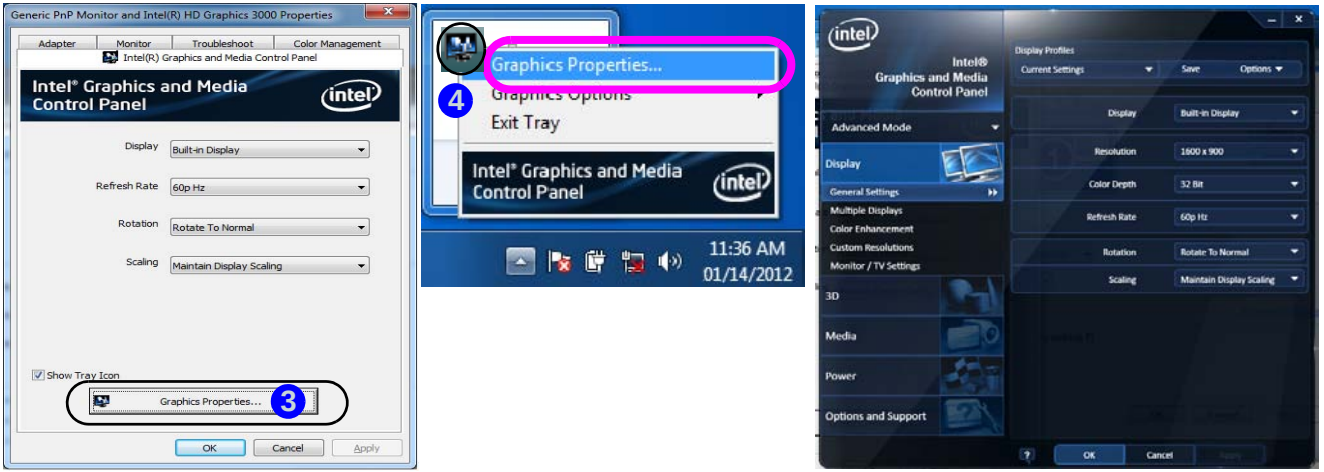


Figure 1 - 9 **- Intel Graphics and Media Control Panel**

To access the ***NVIDIA Control Panel***:

1. Right-click the desktop and select **NVIDIA Control Panel** 5 (***Figure 1 - 10***).

OR

2. Double-click the icon 6 (***Figure 1 - 10***) in the Windows control panel.

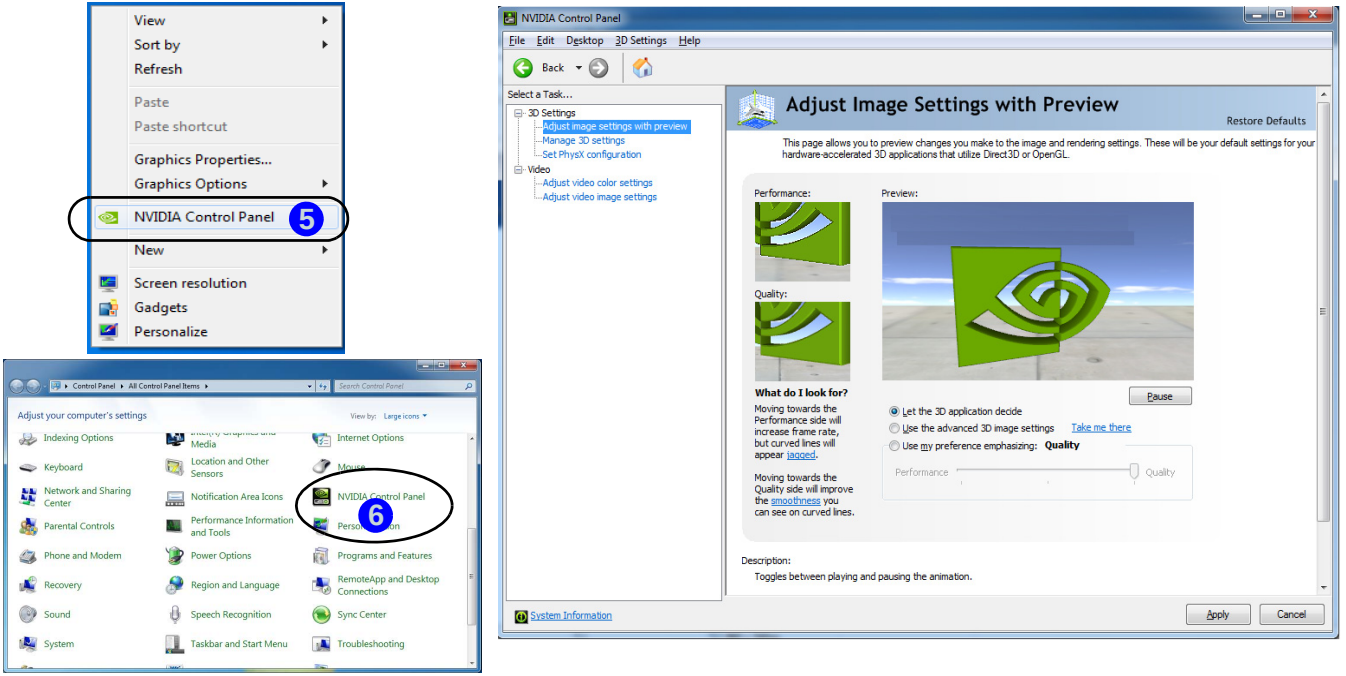


Figure 1 - 10 **- NVIDIA Control Panel**

Power Options

The **Power Options** (**Hardware and Sound** menu) control panel icon in ***Windows*** (see page ***1 - 15***) allows you to configure power management features for your computer. You can conserve power by means of **power plans** and configure the options for the **power button**, **sleep button**, **computer lid (when closed)**, **display** and **sleep** mode from the left menu. Note that the **Power saver** plan may have an affect on computer performance.

Click to select one of the existing plans, or click ***Create a power plan*** in the left menu and select the options to create a new plan. Click ***Change plan settings*** and click ***Change advanced power settings*** to access further configuration options.

Pay attention to the instructions on battery care in ***"Battery Information" on page 3 - 11***.

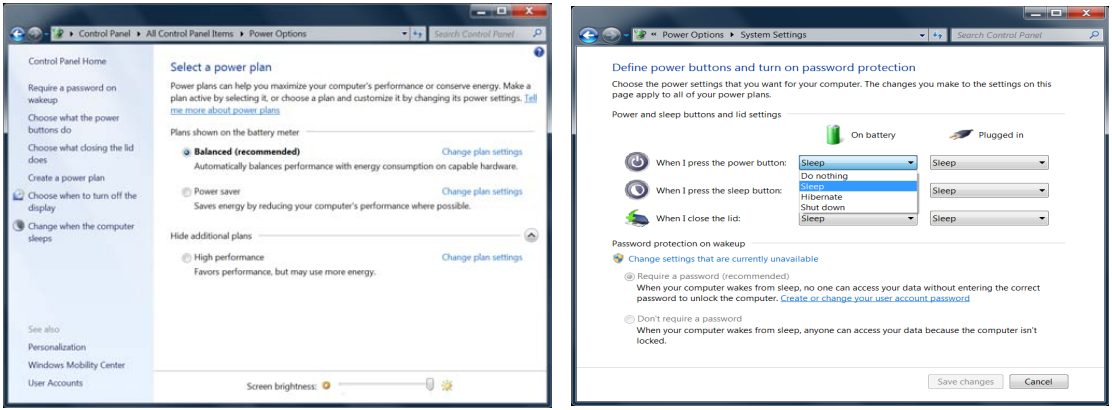


Figure 1 - 11 **- Power Options**

Chapter 2: Storage Devices, Audio & Mouse

Overview

Read this chapter to learn more about the following main features and components of the computer:

- Hard Disk Drive
- Optical Device
- Multi-in-1 Card Reader
- Audio Features
- TouchPad and Buttons/Mouse

Power Safety

Before attempting to access any of the internal components of your computer please ensure that the machine is not connected to the AC power, and that the machine is turned off. Also ensure that all peripheral cables, including phone lines, are disconnected from the computer.

Hard Disk Drive

The hard disk drive(s) is(are) used to store your data in the computer. The hard disk(s) can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 9.5 mm. The hard disk(s) is(are) accessible after removing the hard disk bay cover (**primary hard disk drive**) or component bay cover (**secondary hard disk drive**) from the bottom of your computer as seen below.

Further details on removing and inserting the hard disk are available in ***"Upgrading the Hard Disk Drive(s)" on page 6 - 7***.



Figure 2 - 1
Hard Disk Location

Optical Device

There is a bay for a 5.25" optical (CD/DVD) device (12.7mm height). The actual device will depend on the model you purchased (see *"Storage" on page D - 4*). The optical device is usually labeled "**Drive D:**" and may be used as a boot device if properly set in the **BIOS** (see *"Boot Menu" on page 5 - 13*).

Loading Discs

To insert a CD/DVD, press the open button 1 and carefully place a CD/DVD onto the disc tray with label-side facing up (use just enough force for the disc to click onto the tray's spindle). Gently push the CD/DVD tray in until its lock "clicks" and you are ready to start. The busy indicator 2 will light up while data is being accessed, or while an audio/video CD, or DVD, is playing. If power is unexpectedly interrupted, insert an object such as a straightened paper clip into the emergency eject hole 3 to open the tray.



Figure 2 - 2
Optical Device

Sound Volume Adjustment

How high the sound volume can be set depends on the setting of the volume control within ***Windows***. Click the **Volume** icon on the notification area to check the setting.

Peripherals must be connected before you turn on the system.



CD Emergency Eject

If you need to manually eject a CD (e.g. due to an unexpected power interruption) you may push the end of a straightened paper clip into the emergency eject hole. However please do NOT use a sharpened pencil or similar object that may break and become lodged in the hole.

Disk Eject Warning

Don't try to remove a CD/DVD while the system is accessing it. This may cause the system to "crash".

Handling CDs or DVDs

Proper handling of your CDs/DVDs will prevent them from being damaged. Please follow the advice below to make sure that the data stored on your CDs/DVDs can be accessed.

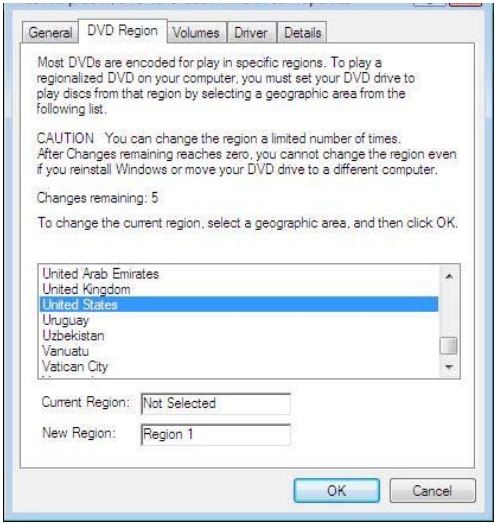
Note the following:

- Hold the CD or DVD by the edges; do not touch the surface of the disc.
- Use a clean, soft, dry cloth to remove dust or fingerprints.
- Do not write on the surface with a pen.
- Do not attach paper or other materials to the surface of the disc.
- Do not store or place the CD or DVD in high-temperature areas.
- Do not use benzene, thinner, or other cleaners to clean the CD or DVD.
- Do not bend the CD or DVD.
- Do not drop or subject the CD or DVD to shock.

DVD Regional Codes

To change the DVD regional codes:

1. Go to the **Control Panel**
2. Double-click **Device Manager (Hardware and Sound)**, then click the **+** next to **DVD/CD-ROM drives**.
3. Double-click on the DVD-ROM device to bring up the **Properties** dialog box, and select the **DVD Region** (tab) to bring up the control panel to allow you to adjust the regional code.



- **Region 1** - USA & Canada
- **Region 2** - Western Europe, Japan, South Africa, Middle East & Egypt
- **Region 3** - South-East Asia, Taiwan, South Korea, The Philippines, Indonesia, Hong Kong
- **Region 4** - South & Central America, Mexico, Australia, New Zealand
- **Region 5** - N Korea, Russia, Eastern Europe, India & Most of Africa
- **Region 6** - China

DVD Region Note

DVD region detection is device dependent, not OS-dependent. You can select your module's region code 5 times. The fifth selection is permanent. This cannot be altered even if you change your operating system or you use the module in another computer.

Figure 2 - 3
DVD Region Codes

Card Reader Cover

Make sure you keep the cover in the card reader when not in use. This will help prevent foreign objects and/or dust getting in to the card reader.

Push-Push Card Reader

The card reader features a push-in/push-out card insertion and ejection mechanism. Simply push the card to insert and eject it, however Ms Duo cards require an adapter.

Multi-in-1 Card Reader

The card reader allows you to use some of the latest digital storage cards. Push the card into the slot and it will appear as a removable device, and can be accessed in the same way as your hard disk (s). Make sure you install the Card Reader driver (see *"Card Reader" on page 4 - 7*).

- MMC (MultiMedia Card) / RSMMC
- SD (Secure Digital) / Mini SD / SDHC / SDXC
- MS (Memory Stick) / MS Pro / MS Duo

Note: Some of these cards require PC adapters that are usually supplied with the cards.



Figure 2 - 4
Left View

1. Card Reader

Audio Features

You can configure the audio options on your computer from the **Sound** control panel in ***Windows***, or from the **Realtek HD Audio Manager** icon in the notification area/control panel (right-click the taskbar notification area icon to bring up an audio menu). The volume may also be adjusted by means of the **Fn** + **F5/F6** key combination (see ***Table 1 - 4, on page 1 - 11***).



Right-click the icon to access the menu above.

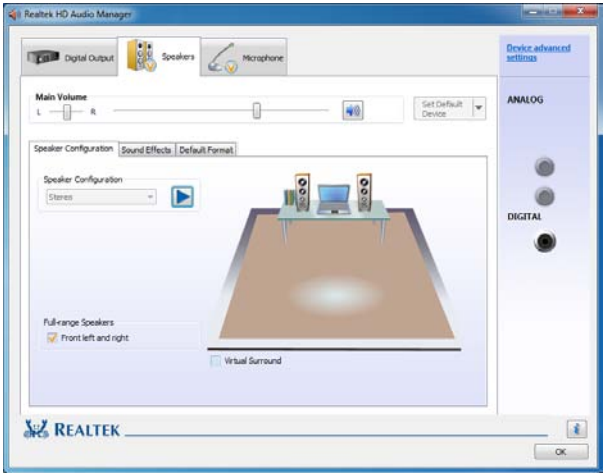


Figure 2 - 5
Realtek Audio Manager

See ***"HDMI Audio Configuration" on page C - 22*** for a description of the audio configuration when connecting an HDMI supported display device.
See ***"THX TruStudio Pro Audio" on page 7 - 56*** for more information on the THX TruStudio Pro Audio setup.

THX TruStudio Audio

Note that **you will need to install the THX TruStudio audio application in order to get maximum audio performance. See** ***"THX TruStudio Pro Audio" on page 7 - 56***.

Volume Adjustment

The sound volume level is set using the volume control within ***Windows*** (and the volume function keys on the computer). Click the volume icon in the notification area to check the setting.

Setup for Audio Recording

To record audio sources on your computer at optimum quality follow the instructions below:

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**) and make sure you are in **Classic View**.
2. Click **Realtek HD Audio Manager** (or right-click the taskbar icon and select **Sound Manager**).
3. Click **Microphone Effects** (tab) in **Microphone** (tab), and then click to select **Noise Suppression** (button), or adjust the **Recording Volume** level to around **60**, to obtain the optimum recording quality.
4. Click **OK** to close the control panel and save the settings.

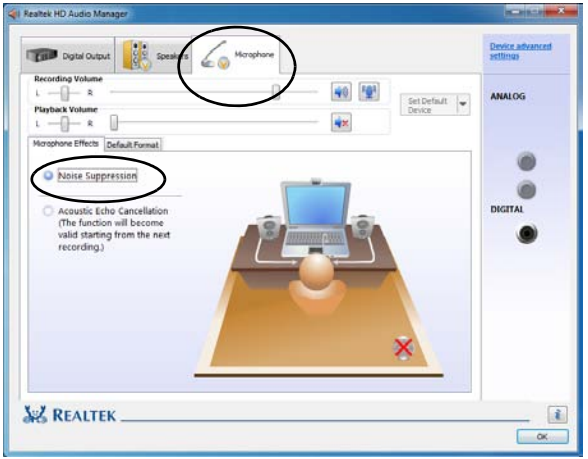


Figure 2 - 6
Realtek Audio Manager - Recording Setup

TouchPad and Buttons/Mouse

The TouchPad is an alternative to the mouse; however, you can also add a mouse to your computer through one of the USB ports. The TouchPad buttons function in much the same way as a two-button mouse.



Mouse Driver

If you are using an external mouse your operating system may be able to auto-configure your mouse during its installation or only enable its basic functions. Be sure to check the device's user documentation for details.

Mouse Driver

If you are using an external mouse your operating system may be able to auto-configure your mouse during its installation or only enable its basic functions. Be sure to check the device's user documentation for details.

Elan TouchPad

Once you have installed the TouchPad driver (see *"TouchPad" on page 4 - 7*) you can configure the functions by double-clicking the TouchPad driver icon in the notification area of the **taskbar** (or from **Options** in the **ELAN** tab in the **Mouse** control panel in ***Windows***). You may then configure the gestures and options to your preferences.

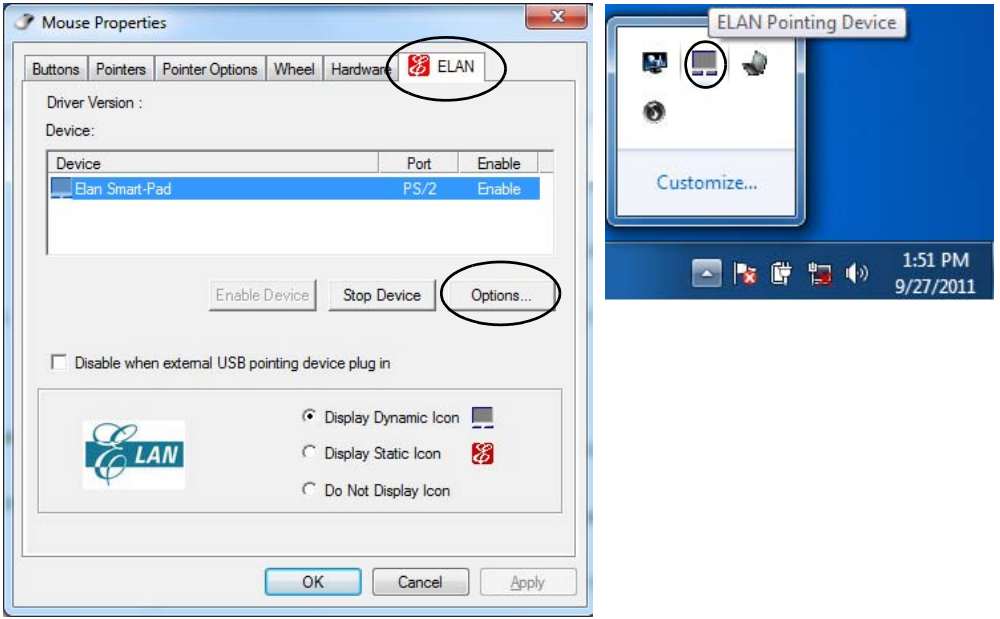


Figure 2 - 7
Mouse Properties (ELAN tab) & Taskbar Icon

The **Elan Smart-Pad** control panel allows you to use a specific gesture (action) on the surface of the TouchPad to perform specific actions to manipulate documents, objects and applications.

Click the menu tabs (**One-finger**, **Multi-finger** or **Additional**) and then the function button on the left to access the **Configuration** controls in the right panel. Click the checkbox to **Enable** most of the controls and click **Apply** to save the settings. Click the close icon or **Yes** to close the control panel.

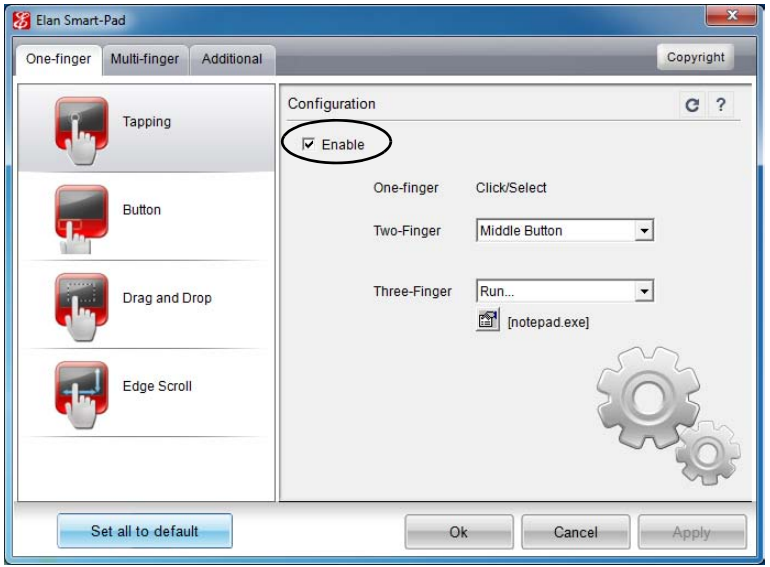


Figure 2 - 8
Smart-Pad Control Panel (Button)

Click the **Function Description** ? button to get a detailed description of any function.

Click the **Default** button to set any of the functions to the default setting.

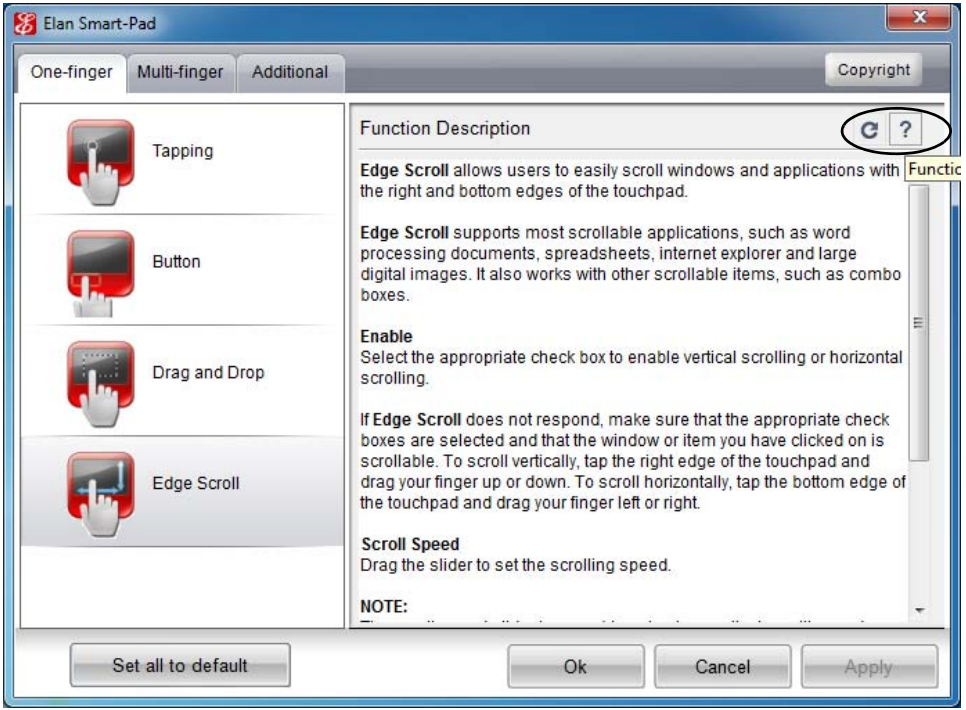


Figure 2 - 9
Smart-Pad Control Panel with Function Description

One-Finger

Tapping

The Smart-Pad supports one, two and three finger tapping, all configured from the **Tapping** control panel in the **One-finger tab**. You can configure two or three finger tapping to perform a number of different functions by selecting them from the drop-down menus provided.



Figure 2 - 10
Tapping

Button

The left and right TouchPad buttons may be configured to perform any action listed in the **Button** drop-down menu.



Figure 2 - 11
Button

Drag and Drop

You can select the different drag and drop methods from the menu provided. The object can be released when you lift the finger off the TouchPad, when you tap again or after a set time delay.

Figure 2 - 12
Drag and Drop



Edge Scroll

Edge Scroll can be configured to use a single finger to scroll vertically or horizontally. To scroll vertically, tap the right edge of the TouchPad and drag the finger up and down. To scroll horizontally, tap the bottom edge of the TouchPad and drag your finger left or right.

Figure 2 - 13
Edge Scroll



Multi-Finger

Zooming

Place two fingers on the TouchPad (for best results use the tips of the fingers) and slide them apart to zoom in, or closer together to zoom out.



Figure 2 - 14
Zooming

Scrolling

The Two-Finger scrolling feature works in most scrollable windows and allows you to scroll horizontally and vertically. Tap the pad surface and slide both fingers in the direction required (vertically or horizontally as long as the option is selected).



Figure 2 - 15
Scrolling

Rotation

You can rotate objects by using a two-finger gesture. Touch and rotate using two fingers on the pad in the direction required. Alternatively place a finger down on the pad and rotate the other finger around it in a circular motion (clockwise or counter-clockwise).

Figure 2 - 16
Rotation



Swipe Page

This gesture is used to activate a Page Up/Page Down operation. Swipe three fingers quickly to the left to go to the previous page, or to the right to go to the next page. After you release your fingers from the pad the page changes, and make sure to lift your fingers immediately after the page change.

Figure 2 - 17
Swipe Page



Fast Keys

The Fast Keys gesture allows you to switch windows or open My Computer.



Figure 2 - 18
Fast Keys

My Computer (Fast Keys)

Tap three fingers simultaneously on the pad and then move them up until you get to the My Computer window, you can then release the fingers from the pad.

Switch Windows (Fast Keys)

Tap three fingers simultaneously on the pad and then move them down until the active window switches, you can then use a single finger to select the window required.

Additional

Palm Tracking

This feature helps guard against accidental contact such as palms resting on the pad. Use the slider to adjust the sensitivity of the feature as appropriate.

Figure 2 - 19
Palm Tracking



Smart Motion

Smart Motion makes it easier to drag objects across the screen or move the pointer across long distances. When a finger reaches the edge of the TouchPad, holding the finger on the edge of the TouchPad will allow the cursor to continue moving until the finger is lifted.

Figure 2 - 20
Smart Motion



Slow Motion

Slow Motion allows you to slow down the cursor movement for more precise control. Pressing and holding key (configured from the drop-down menu) will enable this feature.



Figure 2 - 21
Slow Motion

Chapter 3: Power Management

Overview

To conserve power, especially when using the battery, your computer power management conserves power by controlling individual components of the computer (the monitor and hard disk drive) or the whole system.

This chapter covers:

- The Power Sources
- Turning On the Computer
- Power Plans
- Power-Saving States
- Configuring the Power Buttons
- Power Conservation Modes
- Battery Information

The computer uses enhanced power saving techniques to give the operating system (OS) direct control over the power and thermal states of devices and processors. For example, this enables the OS to set devices into low-power states based on user settings and information from applications.

OS Note

Power management functions will vary slightly depending on your operating system. For more information it is best to refer to the user's manual of your operating system.

(**Note**: All pictures used on the following pages are from the ***Windows 7*** OS.)

The Power Sources

The computer can be powered by either an AC/DC adapter or a battery pack.

AC/DC Adapter

Use only the AC/DC adapter that comes with your computer. The wrong type of AC/DC adapter will damage the computer and its components.

1. Attach the AC/DC adapter to the DC-In jack on the left of the computer.
2. Plug the AC power cord into an outlet, and then connect the AC power cord to the AC/DC adapter.
3. Raise the lid/LCD to a comfortable viewing angle.
4. Press the power button on the top left of the computer **for about 2 - 3 seconds** to turn the computer “on” (note that the power LED on the front of the computer will turn from orange to green when the computer powers on).

Battery

The battery allows you to use your computer while you are on the road or when an electrical outlet is unavailable. Battery life varies depending on the applications and the configuration you're using. **To increase battery life, let the battery discharge completely before recharging** (see ***“How do I completely discharge the battery?” on page 3 - 15***).

We recommend that you do not remove the battery. For more information on the battery, please refer to ***“Battery Information” on page 3 - 11***.

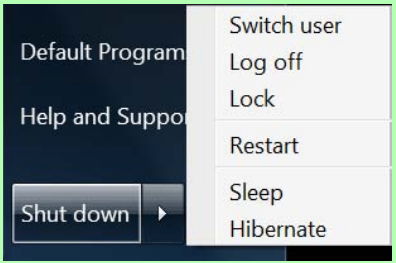
Turning On the Computer

Now you are ready to begin using your computer. To turn it on simply press the power button on the front panel.

When the computer is on, you can use the power button as a Stand by/Hibernate/Shutdown hot-key button when it is pressed for less than **4 seconds** (pressing and holding the power button for longer than this will shut the computer down). Use **Power Options** in the ***Windows*** control panel to configure this feature.

Shut Down

Note that you should always shut your computer down by choosing the **Shut Down** command from the bottom right of the **Start** menu in ***Windows***. This will help prevent hard disk or system problems.



Forced Off

If the system "hangs", and the **Ctrl + Alt + Del** key combination doesn't work, press the power button for **4 seconds**, or longer, to force the system to turn itself off.

Power Button as Stand by or Hibernate Button

You can use the OS's **Power Options** control panel to set the power button to send the system into Stand by or Hibernate mode (see your OS's documentation, or ***"Configuring the Power Buttons" on page 3 - 8*** for details).

Resuming Operation

See *Table 3 - 1, on page 3 - 9* for information on how to resume from a power-saving state.

Password

It is recommended that you enable a password on system resume in order to protect your data.

Power Plans

The computer can be configured to conserve power by means of **power plans**. You can use (or modify) an existing **power plan**, or create a new one.

The settings may be adjusted to set the **display** to turn off after a specified time, and to send the computer into **Sleep** after a period of inactivity.

Click ***Change plan settings*** and then click ***Change advanced power settings*** to access further configuration options in **Advanced Settings**.

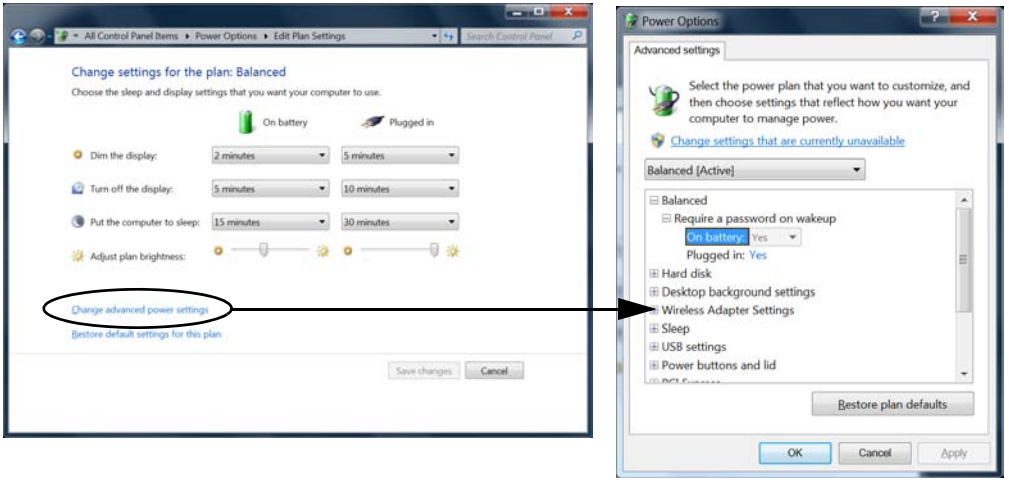


Figure 3 - 1
Power Plan Advanced Settings (Win 7)

Each ***Windows*** **power plan** will also adjust the processor performance of your machine in order to save power. This is worth bearing in mind if you are experiencing any reduced performance (especially under DC/battery power).

Choose **High performance** (you may need to click **Show additional plans** to view the High performance plan) for maximum performance when the computer is powered from an AC power source. Choose the **Power saver** (bear in mind that this scheme may slow down the overall performance of the computer in order to save power) for maximum power saving when the computer is battery (DC power) powered.

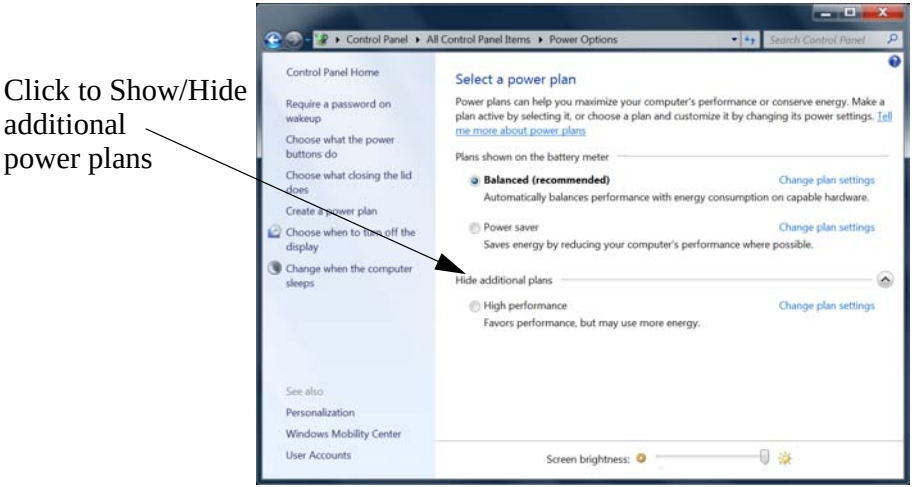


Figure 3 - 2
Power Plans (Win 7)

Power-Saving States

You can use power-saving states to stop the computer's operation and restart where you left off. ***Win 7*** uses the **Sleep, Hibernate** and **Shut Down** power-saving states.

Sleep

In **Sleep** all of your work, settings and preferences are saved to memory before the system sleeps. When you are not using your computer for a certain length of time, which you specify in the operating system, it will enter **Sleep** to save power.

The PC wakes from **Sleep within seconds** and will return you to where you last left off (what was on your desktop) without reopening the application(s) and file(s) you last used.

If your mobile PC in **Sleep** is running on battery power the system will use only a minimum amount of power. After an extended period the system will save all the information to the hard disk and shut the computer down before the battery becomes depleted.

Hibernate

Hibernate uses the least amount of power of all the power-saving states and saves all of your information on a part of the hard disk before it turns the system off. If a power failure occurs the system can restore your work from the hard disk; if a power failure occurs when work is saved only to memory, then the work will be lost. **Hibernate** will also return you to where you last left off within seconds. You should put your mobile PC into **Hibernate** if you will not use the computer for a period of time, and will not have the chance to charge the battery.

Shut down

You should **Shut down** the computer if you plan to install new hardware (don't forget to remove the battery and follow all the safety instructions in **Chapter 6**), plan to be away from the computer for several days, or you do not need it to wake up and run a scheduled task. Returning to full operation from **Shut down** takes longer than from **Sleep** or **Hibernate**.

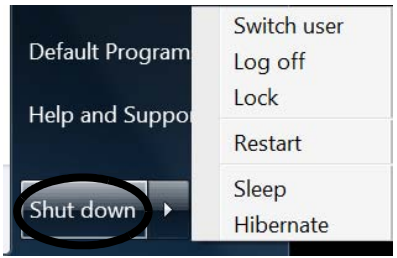


Figure 3 - 3
Start Menu Power

Password Protection

It is recommended that you enable a password on wake up in order to protect your data.

However you can disable this setting from the **Power Options** menu by clicking ***Require a password on wakeup*** in the left menu, and selecting the options (click ***Change settings that are currently unavailable***).

Configuring the Power Buttons

The power/sleep button (**Fn + F4** key combo) and closed lid may be set to send the computer in to a power-saving state. Click **Choose what the power buttons do** on the left menu in **Power Options** to bring up the menu.

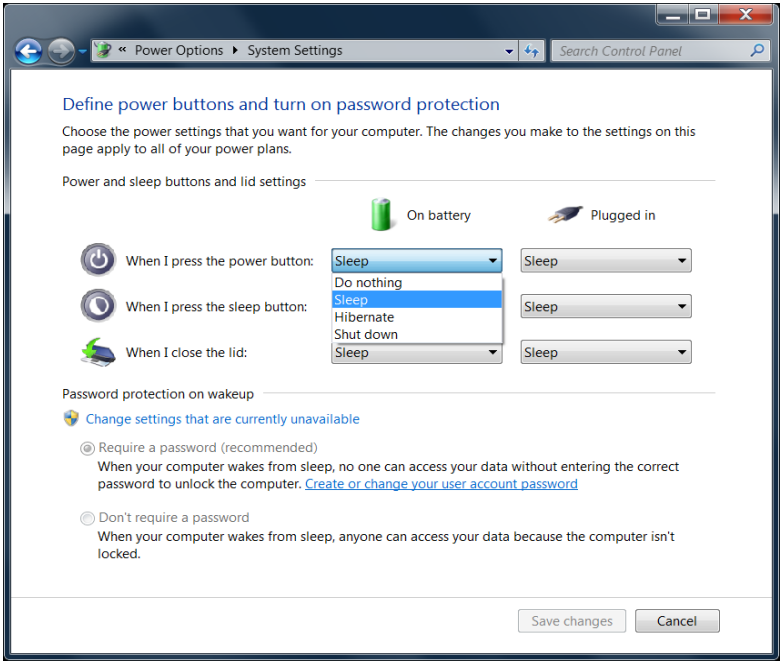


Figure 3 - 4
Power Options Define Power Buttons

Resuming Operation

You can resume operation from power-saving states by pressing the power button, or in some cases pressing the sleep button (**Fn + F4** key combo).

Power Status	Icon Color	To Resume
Power Off	Off	Press the Power Button
Sleep	Blinking Green	Press the Power Button Press the Sleep Button (Fn + F4 Key Combo)
Hibernate	Off (battery) Orange (AC/DC adapter)	Press the Power Button
Display Turned Off	Green	Press a Key or Move the Mouse/Touchpad

Power Button

When the computer is on, you can use the power button as a Sleep/Hibernate/Shut Down hot key button when it is pressed for less than **4 seconds** (pressing and holding the power button for longer than this will force the computer to shut down).

Closing the Lid

If you have chosen to send the computer to **Sleep** when the lid is closed, raising the lid will wake the system up.

Table 3 - 1 **Resuming Operation**

Power Conservation Modes

The **Energy Star** setting will result in maximum power saving, but with the possible loss of some performance.

Setting the mode to **Balance** will give power saving matched with performance.

Performance will give optimum computer performance but with less power conservation.

Power Conservation Modes

This system supports **Energy Star** power management features that place computers (CPU, hard drive, etc.) into a low-power sleep modes after a designated period of inactivity. Adjust **Power Conservation Modes** from the **Control Center**:

1. Press the **Fn + Esc** key combination to toggle the **Control Center** on/off.
2. Click either the **Performance**, **Balanced** or **Energy Star** button.
3. Click in a blank area of the icon or press a key on the keyboard to exit **Power Conservation Mode** without making any changes.

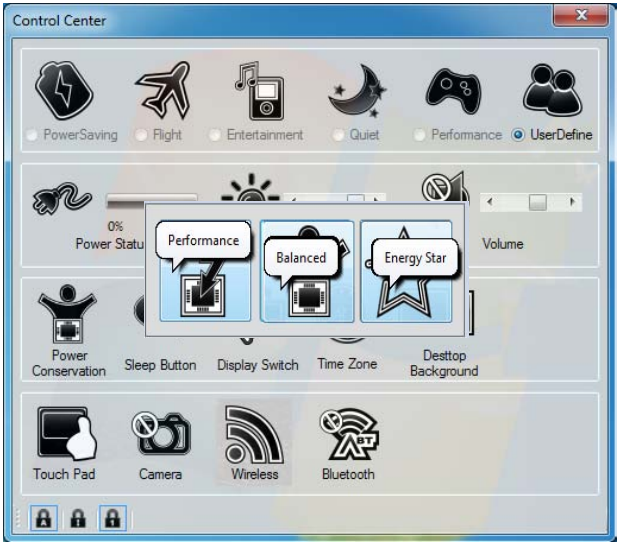


Figure 3 - 5
Control Center

Battery Information

Follow these simple guidelines to get the best use out of your battery.

Battery Power

Your computer's battery power is dependent upon many factors, including the programs you are running, and peripheral devices attached. You can set actions to be taken (e.g. Shut down, Hibernate etc.), and set critical and low battery levels from power plan **Change plan settings > Change advanced power settings** (see *Figure 3 - 1 on page 3 - 4*).

Click the battery icon in the notification area to see the current battery level and charge status.

Low Battery Warning

When the battery is critically low, immediately connect the AC/DC adapter to the computer or save your work, otherwise, the unsaved data will be lost when the power is depleted.

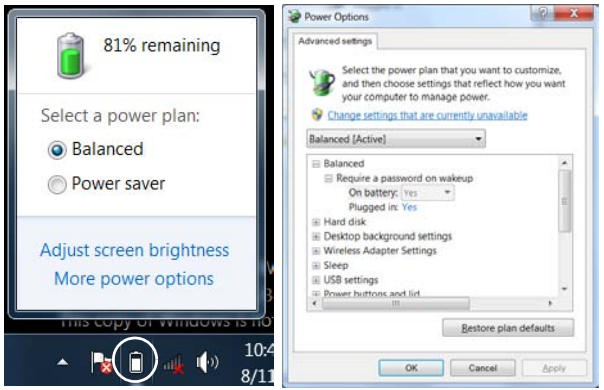


Figure 3 - 6
Battery Icon (Notification Area) & Battery Advanced Settings

Windows Mobility Center

The **Windows Mobility Center** control panel provides an easy point of access for information on battery status, power plans used and wireless device status etc.

Conserving Battery Power

- Use a **power plan** that conserves power (e.g **Power saver**), however note that this may have an affect on computer performance.
- Lower the brightness level of the LCD display. The system will decrease LCD brightness slightly to save power when it is not powered by the AC/DC adapter.
- Reduce the amount of time before the display is turned off.
- Close wireless, Bluetooth, modem or communication applications when they are not being used.
- Disconnect/remove any unnecessary external devices e.g. USB devices.

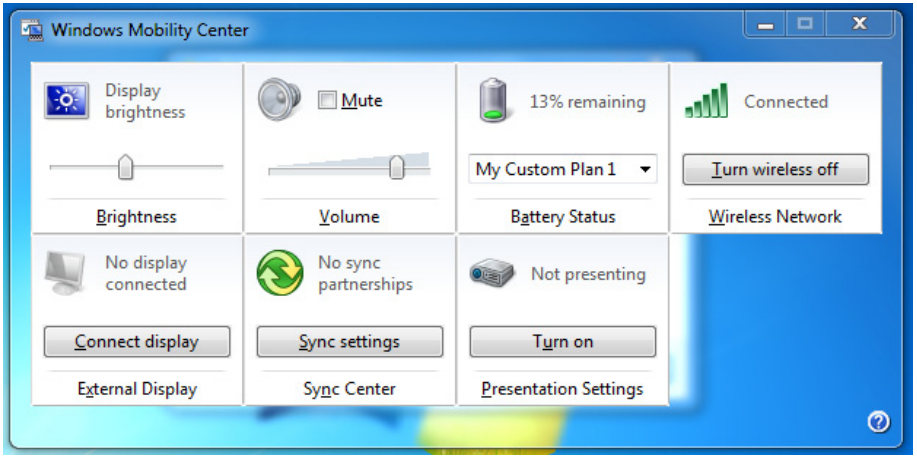


Figure 3 - 7
Windows Mobility Center

Battery Life

Battery life may be shortened through improper maintenance. **To optimize the life and improve its performance, fully discharge and recharge the battery at least once every 30 days**.

We recommend that you do not remove the battery yourself. If you do need to remove the battery for any reason (e.g. long term storage) see ***"Removing the Battery" on page 6 - 4***.

New Battery

Always completely discharge, then fully charge, a new battery (see ***"Battery FAQ" on page 3 - 15*** for instructions on how to do this).

Recharging the Battery with the AC/DC Adapter

The battery pack automatically recharges when the AC/DC adapter is attached and plugged into an electrical outlet. If the computer is powered on, and in use, it will take several hours to fully recharge the battery. When the computer is turned off but plugged into an electrical outlet, battery charge time is less. (Refer to ***"LED Indicators" on page 1 - 7*** for information on the battery charge status, and to ***"Battery Information" on page 3 - 11*** for more information on how to maintain and properly recharge the battery pack.)



Caution

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer's instructions.

Proper handling of the Battery Pack

- DO NOT disassemble the battery pack under any circumstances.
- DO NOT expose the battery to fire or high temperatures, it may explode.
- DO NOT connect the metal terminals (+, -) to each other.



Damaged Battery Warning

Should you notice any physical defects (e.g. the battery is bent out of shape after being dropped), or any unusual smells emanating from the notebook battery, shut your computer down immediately and contact your service center. If the battery has been dropped we do not recommend using it any further, as even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire. It is recommended that you replace your computer battery every two years.

Battery FAQ

How do I completely discharge the battery?

Use the computer with battery power until it shuts down due to a low battery. Don't turn off the computer even if a message indicates the battery is critically low, just let the computer use up all of the battery power and shut down on its own.

1. Save and close all files and applications.
2. **Create** a **power plan** for discharging the battery and set all the options to **Never**.

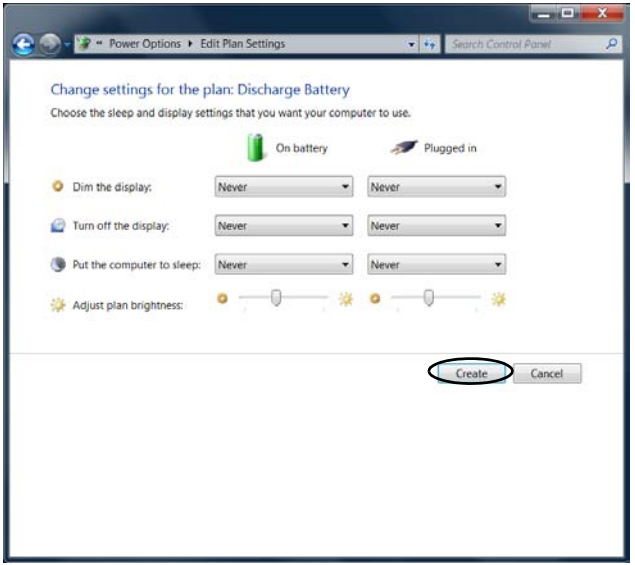


Figure 3 - 8
Power Plan Create

3. Click ***Change plan settings*** (after creating it) and click ***Change plan settings > Change advanced power settings***.

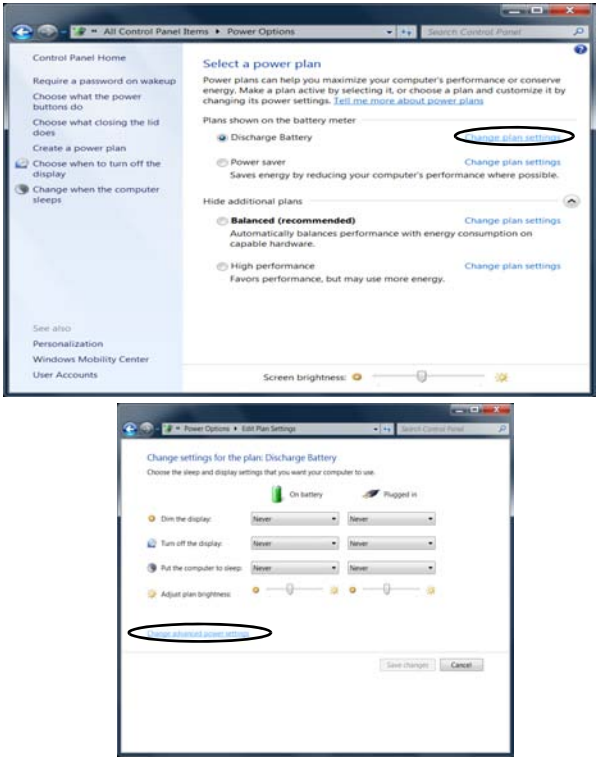


Figure 3 - 9
Change Plan Settings / Change Advanced Power Settings

4. Scroll down to **Battery** and click **+** to expand the battery options.
5. Choose the options below (click **Yes** if a warning appears):

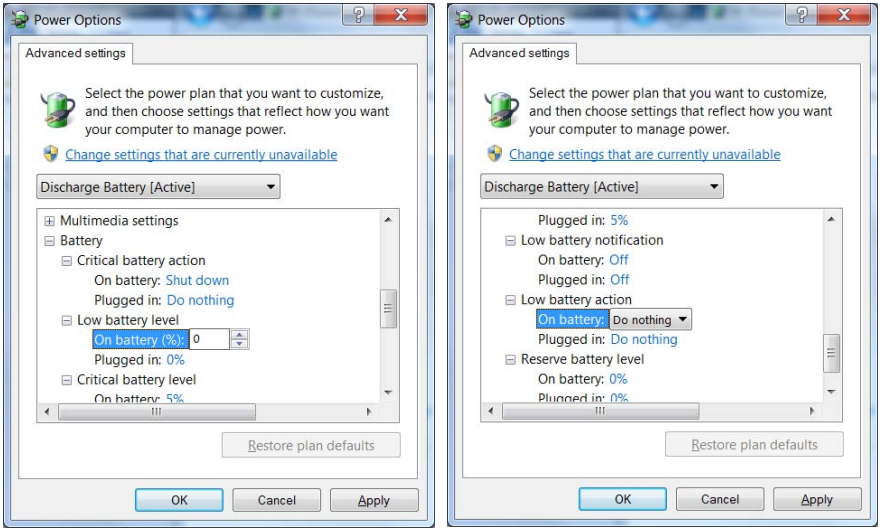


Figure 3 - 10
Power Options Advanced Settings - Battery

- Low battery levels = 0%
- Critical battery Levels = 1%
- Low battery action = Do Nothing
- Critical battery action (On battery) = Shut Down
- Critical battery action (Plugged in) = Do Nothing

How do I fully charge the battery?
When charging the battery, don't stop until the LED charging indicator light changes from orange to green.

How do I maintain the battery?
Completely discharge and charge the battery at least once every 30 days or after about 20 partial discharges.

Chapter 4: Drivers & Utilities

This chapter deals with installing the drivers and utilities essential to the operation or improvement of some of the computer's subsystems. The system takes advantage of some newer hardware components for which the latest versions of most available operating systems haven't built in drivers and utilities. Thus, some of the system components won't be auto-configured with an appropriate driver or utility during operating system installation. Instead, you need to manually install some system-required drivers and utilities.

Driver Installation & Power

When installing drivers make sure your computer is powered by the AC/DC adapter connected to a working power source. Some drivers draw a significant amount of power during the installation procedure, and if the remaining battery capacity is not adequate this may cause the system to shut down and cause system problems (note that there is no safety issue involved here, and the battery will be rechargeable within 1 minute).

What to Install

The ***Device Drivers & Utilities + User's Manual*** disc contains the drivers and utilities necessary for the proper operation of the computer. ***Table 4 - 1, on page 4 - 3*** lists what you need to install and **it is very important that the drivers are installed in the order indicated**.

Module Driver Installation

The procedures for installing drivers for the **PC Camera, WLAN** and **Combination Bluetooth & WLAN** modules (you should also install the **THX Studio Pro Audio** and **Intel Rapid Storage Technology** drivers as instructed in Chapter 7) are provided in ***"Modules" on page 7 - 1***.

Driver Installation

Insert the *Device Drivers & Utilities + User's Manual* disc and click ***Install Drivers*** (button), or ***Option Drivers*** (button) to access the **Optional** driver menu.



Figure 4 - 1 **- Drivers Installer Screen 1**

Note: If you need to reinstall any driver, you should uninstall the driver first.

1. Check the driver installation order from ***Table 4 - 1, on page 4 - 3*** (**the drivers must be installed in this order**) which is the same as that listed in the ***Drivers Installer*** menu below.
2. Click to select the driver you wish to install, (you should note down the drivers as you install them).
3. Follow the instructions for each individual driver installation procedure as listed on the following pages.



Figure 4 - 2 **- Drivers Installer Screen 2**

Windows 7 SP1 Driver	Page	Windows 7 SP1 Driver	Page
Chipset	*Page 4 - 6*	*Setting Up SATA RAID or AHCI Mode*	*Page 7 - 2*
Video (VGA)	*Page 4 - 6*	*PC Camera Module*	*Page 7 - 15*
NVIDIA Video (VGA)	*Page 4 - 6*	*Wireless LAN Module*	*Page 7 - 23*
LAN	*Page 4 - 6*	*Intel® Wireless Display Application*	*Page 7 - 44*
Card Reader	*Page 4 - 7*	*Bluetooth Module*	*Page 7 - 49*
TouchPad	*Page 4 - 7*	*THX TruStudio Pro Audio*	*Page 7 - 56*
Hot Key	*Page 4 - 7*	*Intel® Rapid Storage Technology Driver* (required for hard disks in AHCI mode)	*Page 7 - 61*
USB 3.0	*Page 4 - 7*	*Intel® Rapid Start Technology Driver*	*Page 7 - 66*
MEI Driver	*Page 4 - 7*		
Audio	*Page 4 - 7*		

Table 4 - 1 **- Driver Installation**

Note all drivers provided are for Windows 7 with Service Pack 1.

Note that you need to install both the WLAN & Bluetooth drivers for the WLAN & Bluetooth Combo modules.

Manual Driver Installation

Click the **Browse CD/DVD** button in the *Drivers Installer* application and browse to the executable file in the appropriate driver folder.

Windows Update

After installing all the drivers make sure you enable **Windows Update** in order to get all the latest security updates etc. (all updates will include the latest **hotfixes** from Microsoft). See ***"Windows Update" on page 4 - 8*** for instructions.

Updating/Reinstalling Individual Drivers

If you wish to update/reinstall individual drivers it may be necessary to uninstall the original driver.To do this go to the **Control Panel** in the ***Windows OS*** and double-click the **Programs and Features** icon (**Programs > Uninstall a program**). Click to select the driver (if it is not listed see below) and click **Uninstall**, and then follow the on screen prompts (it may be necessary to restart the computer). Reinstall the driver as outlined in this chapter.

If the driver is not listed in the **Programs and Features** menu:

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**).
2. Double-click **Device Manager** (**Hardware and Sound > Device Manager**).
3. Double-click the **device** you wish to update/reinstall the driver for (you may need to click "+" to expand the selection).
4. Click **Driver** (tab) and click the **Update Driver** or **Uninstall** button and follow the on screen prompts.

User Account Control

If a **User Account Control** prompt appears as part of the driver installation procedure, click **Continue**/**Allow**, and follow the installation procedure as directed.

Windows Security Message

If you receive a ***Windows*** security message as part of the driver installation process. Just click ***"Install this driver software anyway"*** or **Install** to continue the installation procedure.

You will receive this message in cases where the driver has been released after the version of ***Windows*** you are currently using. All the drivers provided will have already received certification for ***Windows***.

New Hardware Found

If you see the message "**New Hardware Found**" during the installation procedure (**other than when outlined in the driver install procedure**), click **Cancel** to close the window, and follow the installation procedure.

Driver Installation Procedure

Insert the *Device Drivers & Utilities + User's Manual* disc and click ***Install Drivers*** (button), or ***Option Drivers*** (button) to access the **Optional** driver menu.



Driver Installation General Guidelines

The driver installation procedure outlined in this Chapter (and in **Chapter 7 Options & Modules**), are accurate at the time of going to press.

Drivers are always subject to upgrade and revision so the exact procedure for certain drivers may differ slightly. As a general guide follow the default on screen instructions for each driver (e.g. **Next > Next > Finish**) unless you are an advanced user. In many cases a restart is required to install the driver.

Chipset

1. Click **1.Install Chipset Driver > Yes**.
2. Click **Next > Yes > Next > Next**.
3. Click **Finish** to restart the computer.

Video (VGA)

1. Click **2.Install VGA Driver > Yes**.
2. Click **Next > Yes > Next > Next**.
3. Click **Finish** to restart the computer.

NVIDIA Video (VGA)

1. Click **3.Install NVIDIA VGA Driver > Yes**.
2. Click **AGREE AND CONTINUE (**button) to accept the terms of the license agreement.
3. Click **Next > Next**.
4. Click the **RESTART NOW** button to restart the computer.

Note: After installing the video driver go to the **Display**/**Display Settings** control panel to adjust the video settings to the highest resolution.

LAN

1. Click **4.Install LAN Driver > Yes**.
2. Click **Next > Install**.
3. Click **Finish**.

Card Reader

1. Click **5.Install Cardreader Driver > Yes**.
2. Click **Finish**.

TouchPad

1. Click **6.Install Touchpad Driver > Yes**.
2. Click **Next**.
3. Click the button to accept the license, and then click **Next**.
4. Click **Finish > Restart Now** to restart the computer.

Hot Key

1. Click **7.Install Hotkey AP > Yes**.
2. Click **Next > Next**.
3. Click **Finish > Finish** to restart your computer.

USB 3.0

1. Click **8.Install USB 3.0 Driver > Yes**.
2. Click **Next > Yes > Next > Next**.
3. Click **Finish** to restart the computer.

MEI Driver

1. Click **9.Install MEI Driver > Yes**.
2. Click **Next > Yes > Next**.
3. Click **Finish**.

Audio

1. Click **10. Install Audio Driver > Yes**.
2. Click **Next**.
3. Click **Finish** to restart the computer.

After installing the audio driver the system will not return to the **Drivers Installer** screen. To install any of the optional drivers, eject the *Device Drivers & Utilities + User's Manual* disc and then reinsert it (or double-click the disc icon in My Computer), and click **Option Drivers** (button) to access the optional driver menu.

It is recommended that you install the **THX Tru Studio Pro Audio** application for maximum audio performance (see ***"THX TruStudio AP Installation" on page 7 - 56***) and **Intel Rapid Storage Technology** driver (see ***"Intel® Rapid Storage Technology Driver" on page 7 - 61*** - required for AHCI mode).



Windows Update

After installing all the drivers make sure you enable **Windows Update** in order to get all the latest security updates etc. (all updates will include the latest **hotfixes** from Microsoft).

To enable **Windows Update make sure you are connected to the internet**:

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**).
2. Click **Windows Update** (System and Security/ Security).
3. Click **Check for updates** (button).
4. The computer will now check for updates (you need to be connected to the internet).
5. Click **Install now** (button) to begin checking for the updates.
6. Click **Install updates** (button) to install the updates.

Windows Experience Index

After Video (VGA) driver has been installed, and the system restarted, the OS will automatically run the "Winsat.exe" to rate the performance. If you have restarted the system during this time then follow the instructions below to update the information.

After the drivers are installed follow this procedure to ensure an accurate rating from the ***Windows Experience Index*** (make sure the AC/DC adapter is plugged in):

1. Click **Start**, and click **Control Panel**.
2. Click **Performance Information and Tools** (**System and Security > System > Check the Windows Experience Index**).
3. Click "**Rate this computer/Refresh Now/Re-run the assessment**".
4. The computer will take a few minutes to assess the system performance.
5. Close the control panel.

Optional Drivers

See the pages indicated in ***Table 4 - 1, on page 4 - 3*** for the driver installation procedures for any modules included in your purchase option.



Figure 4 - 3 **- Optional Drivers Installer Screen**

Note that you need to install both the WLAN & Bluetooth drivers for all the Bluetooth Combo modules.

Chapter 5: BIOS Utilities

Overview

This chapter gives a brief introduction to the computer's built-in software:

Diagnostics: The **POST** (Power-On Self Test)

Configuration: The ***Setup*** utility
If your computer has never been set up, or you are making important changes to the system (e.g. hard disk setup), then you should review this chapter first and note the original settings found in ***Setup***. Even if you are a beginner, keep a record of the settings you find and any changes you make. This information could be useful if your system ever needs servicing.

There is one general rule: *Don't make any changes unless you are sure of what you are doing*. Many of the settings are required by the system, and changing them could cause it to become unstable or worse. If you have any doubts, consult your service representative.



BIOS Screens

Note that the BIOS screens pictured on these pages are intended for guidance in setting up your system's BIOS.

BIOS versions are subject to constant change and revision, therefore your computer's actual screens may appear slightly different from those pictured on these pages.

The Power-On Self Test (POST)

If you enable the **Boot-time Diagnostic Screen** in the Setup Utility, each time you turn on the computer the system takes a few seconds to conduct a **POST**, including a quick test of the on-board RAM (memory).

As the **POST** proceeds, the computer will tell you if there is anything wrong. If there is a problem that prevents the system from booting, it will display a system summary and prompt you to run ***Setup***.

If there are no problems, the ***Setup*** prompt will disappear and the system will load the operating system. Once that starts, you can't get into ***Setup*** without rebooting.

Failing the POST

Errors can be detected during the **POST**. There are two categories, “fatal” and “non-fatal”.

Fatal Errors

These stop the boot process and usually indicate there is something seriously wrong with your system. Take the computer to your service representative or authorized service center as soon as possible.

Non-Fatal Errors

This kind of error still allows you to boot. You will get a message identifying the problem (make a note of this message!) and you can then press **F7** (the **F7** on screen will be highlighted to illustrate that the system is processing the request) for boot options.

Press **F2** (give the system a few seconds to enter ***Setup***; the **F2** on screen will be highlighted to illustrate that the system is processing the request) to run the **Setup** program and try to correct the problem. If you still get an error message after you change the setting, or if the “cure” seems even worse, call for help.



BIOS Settings Warning

Incorrect settings can cause your system to malfunction. To correct mistakes, return to *Setup* and restore the ***Previous Values*** with <**F2**>, or **Optimized Defaults** with <**F3**>.

The Setup Utility

The **Aptio Setup Utility** tells the system how to configure itself and manage basic features and subsystems (e.g. port configuration).

Entering Setup

To enter ***Setup***, turn on the computer and press **F2** (give the system a few seconds to enter ***Setup***; the **F2** on screen will be highlighted to illustrate that the system is processing the request) during the **POST** (or press **F7** for boot options). If you get a "Keyboard Error", (usually because you pressed **F2** too quickly) just press **F2** again.

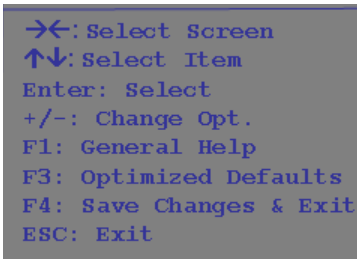
If the computer is already on, reboot using the **Ctrl + Alt + Delete** combination and then hold down **F2** when prompted. The ***Setup*** main menu will appear.

To see the boot options press **F7.**

Setup Screens

The following pages contain additional advice on portions of the ***Setup***. Along the top of the screen is a menu bar with menu headings. When you select a heading, a new screen appears. Scroll through the features listed on each screen to make changes to ***Setup***.

Instructions on how to navigate each screen are in the box at the bottom right side of the screen.



If these tools are confusing, press **F1** to call up a **General Help** screen, and then use the arrow keys to scroll up or down the page.

The **Item Specific Help** on the upper right side of each screen explains the highlighted item and has useful messages about its options.

If you see an arrow ▶ next to an item, press **Enter** to go to a sub-menu on that subject. The sub-menu screen that appears has a similar layout, but the **Enter** key may execute a command.

Setup Menus

The **Setup** menus shown in this section are for **reference** only. Your computer's menus will indicate the configuration appropriate for your model and options.

Figure 5 - 1
Navigation Menu

Main Menu

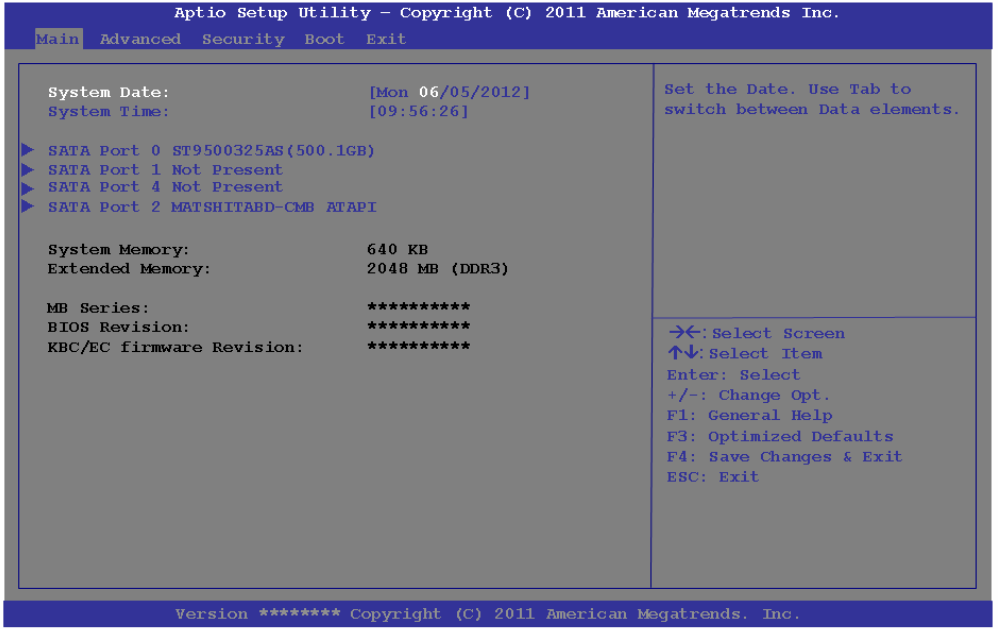


Figure 5 - 2
Main Menu

System Time & Date (Main Menu)

The hour setting uses the 24-hour system (i.e., ØØ = midnight; 13 = 1 pm). If you can change the date and time settings in your operating system, you will also change these settings. Some applications may also alter data files to reflect these changes.

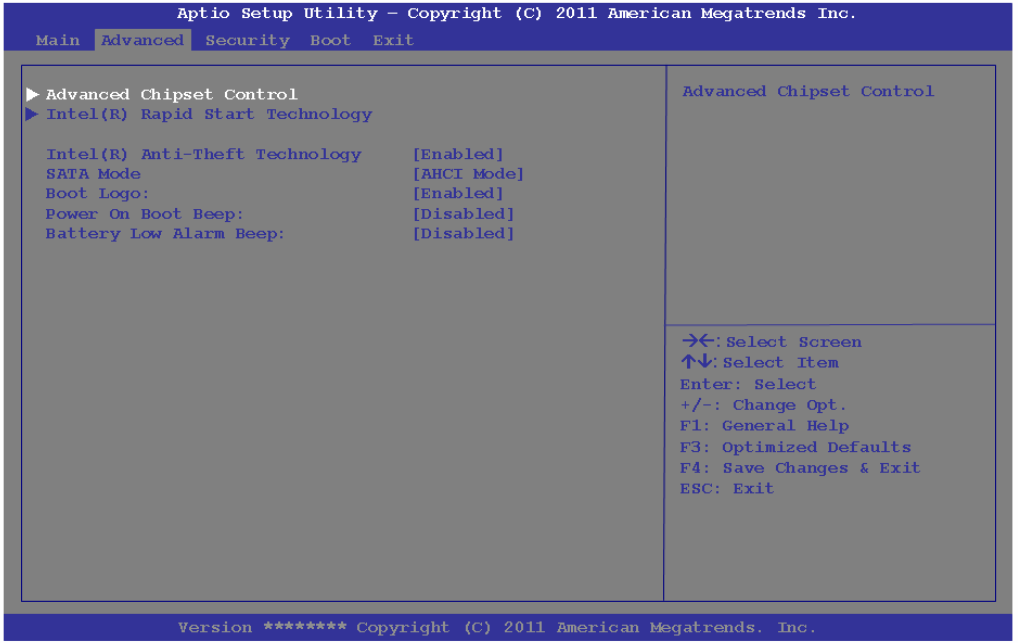
SATA Port # (Main Menu)
Pressing **Enter** opens the sub-menu to show the configuration of a optical Device/ HDD on the computer's SATA Ports.

System/Extended Memory (Main Menu)
This item contains information on the system memory, and is not user configurable. The system will auto detect the amount of memory installed.

MB Series / BIOS Revision / KBC/EC Firmware Revision (Main Menu)
This item contains information on the BIOS version and video card etc., and is not user configurable.

Advanced Menu

Figure 5 - 3
Advanced Menu



Advanced Chipset Control (Advanced Menu)
The sub-menu here allows you to adjust the **Bluetooth Power Setting** .

Bluetooth Power Setting (Advanced Menu > Advanced Chipset Control)
You can adjust the Bluetooth module power setting to your preference. The default setting (**Disabled**) will see the Bluetooth module powered off when the system is started up or restarted. Enabling the power setting will have the module retain the last power status (on or off) before any restart or shut down.

Intel(R) Rapid Start Technology (Advanced Menu)
Enable/disable **Intel(R) Rapid Start Technology** from this menu. The rapid start hibernation mode can resume power within 5 to 6 seconds and can remember your computer's state with zero power.

Intel Anti-Theft Technology (Advanced Menu)
Anti-Theft Technology, which is built-in to the processor of the computer, allows system administrators to render your computer useless to thieves by sending a poison pillencrypted SMS message over a 3G network etc. Administrators can also remotely unlock a recovered computer quickly, or direct the system to send location information (GPS coordinates) back to a central server.



SATA Mode Selection

If you have installed the ***Windows 7*** operating system with either **IDE**, **AHCI or RAID** mode enabled, **DO NOT** disable the set mode (if you wish to disable the set mode you will need to reinstall the ***Windows 7*** OS).

SATA Mode (Advanced Menu)
You can configure SATA (Serial ATA) control to operate in **IDE** (native/compatible), **AHCI** (Advanced Host Controller Interface) or **RAID** (Redundant Array of Independent disks) modes from this menu. The **SATA Mode** should be set **BEFORE installing an operating system**, and after you have backed up all necessary files and data (see sidebar). See ***"Setting Up SATA RAID or AHCI Mode" on page 7 - 2*** for details. Make sure you install the **Intel Rapid Storage Technology application** if you have set the SATA Mode to **RAID** or **AHCI** ***"Intel® Rapid Storage Technology Driver" on page 7 - 61*****.**

Boot Logo (Advanced Menu)
Use this menu item to enable/disable the Boot Logo screen at system startup.

Power On Boot Beep (Advanced Menu)
Use this menu item to enable/disable the beep as the computer starts up.

Battery Low Alarm Beep (Advanced Menu)
Use this menu item to enable/disable the battery low alarm beep.

Security Menu

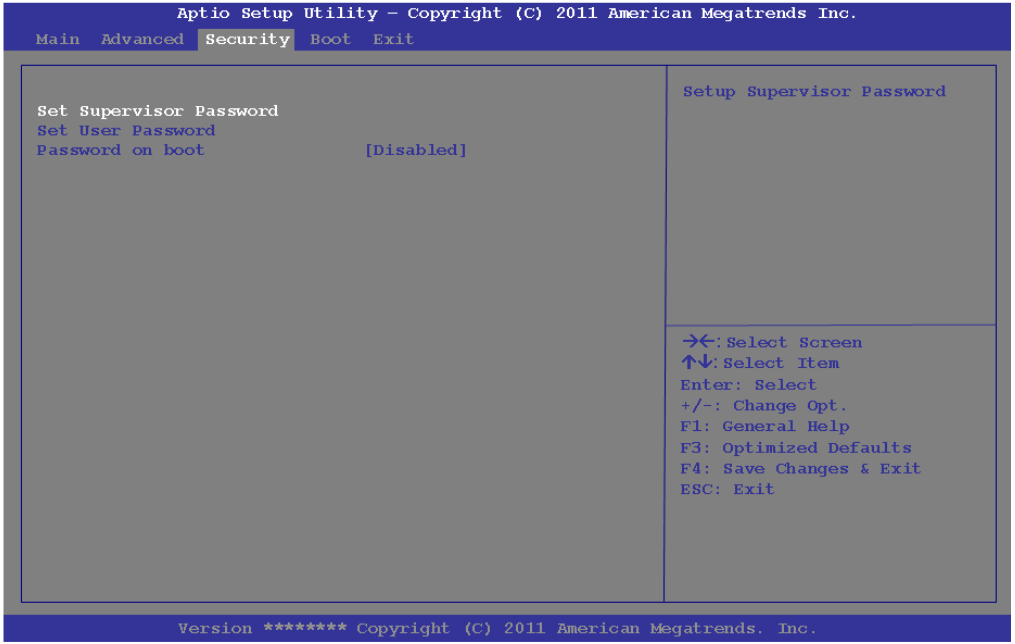


Figure 5 - 4
Security Menu

Security Menu

The changes you make here affect the access to the **Setup** utility itself, and also access to your machine as it boots up after you turn it on. These settings do not affect your machine or network passwords which will be set in your software OS.

Set Supervisor Password (Security Menu)

You can set a password for access to the **Aptio Setup Utility**. This will not affect access to the computer OS (only the **Aptio Setup Utility**).



Password Warning

If you set a boot password (Password on boot is "Enabled"), **NEVER** forget your password.

The consequences of this could be serious. If you cannot remember your boot password you must contact your vendor and you may lose all of the information on your hard disk.

Note: To clear existing passwords press **Enter** and type the existing password, then press **Enter** for the new password (without typing any password entry) and **Enter** again to confirm the password clearance.

Note: *You can only set the user password after you have set the supervisor password.*

Password on boot: (Security Menu)
Specify whether or not a password should be entered to boot the computer (**you may only set a password on boot if a supervisor password is enabled**). If "***Enabled***" is selected, only users who enter a correct password can boot the system (**see the warning in the sidebar**). The default setting is "***Disabled***".

Note: To clear existing passwords press **Enter** and type the existing password, then press **Enter** for the new password (without typing any password entry) and **Enter** again to confirm the password clearance.

Boot Menu

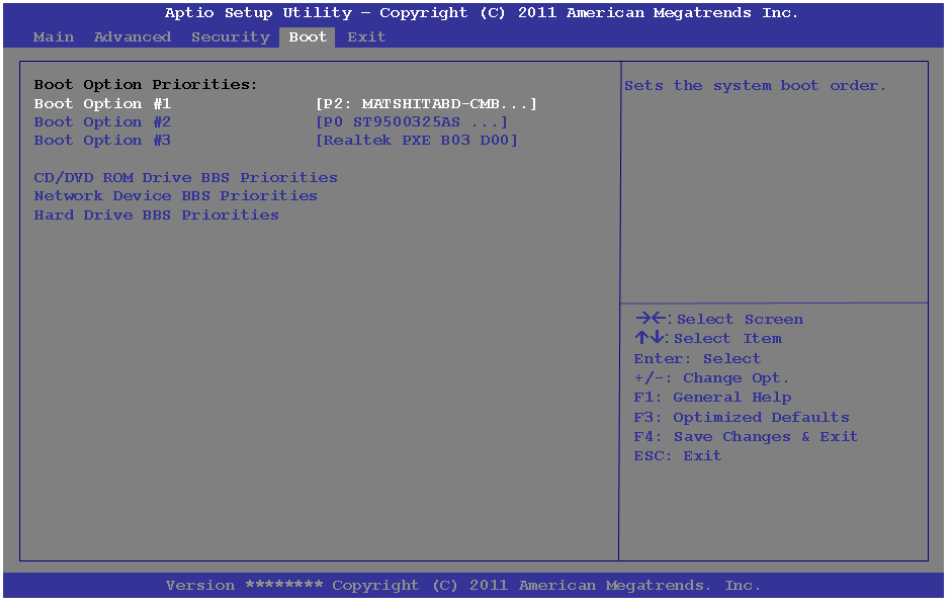


Figure 5 - 5
Boot Menu

When you turn the computer on it will look for an operating system (e.g. ***Windows 7***) from the devices listed in this menu, and **in this priority order**. If it cannot find the operating system on that device, it will try to load it from the next device in the order specified in the **Boot Option Priorities**. Item specific help on the right is available to help you move devices up and down the order.

BIOS Screens

Note that the BIOS screens pictured on these pages are intended for guidance in setting up your system's BIOS.

BIOS versions are subject to constant change and revision, therefore your computer's actual screens may appear slightly different from those pictured on these pages.

Boot Option Priorities (Boot Menu)

Use the arrow keys to move up and down the menu and press ***Enter***, then select the item in the **Boot Option #** using the arrow keys, and press ***Enter*** again to set the item as the appropriate boot priority. ***You can*** go to either **Network Device BBS Priorities**, **CD/DVD ROM Drive BBS Priorities** or **Hard Drive BBS Priorities** and use the **+** and **- keys** to move any device's boot priority up and down the list (the selected device will be highlighted in white).

Exit Menu

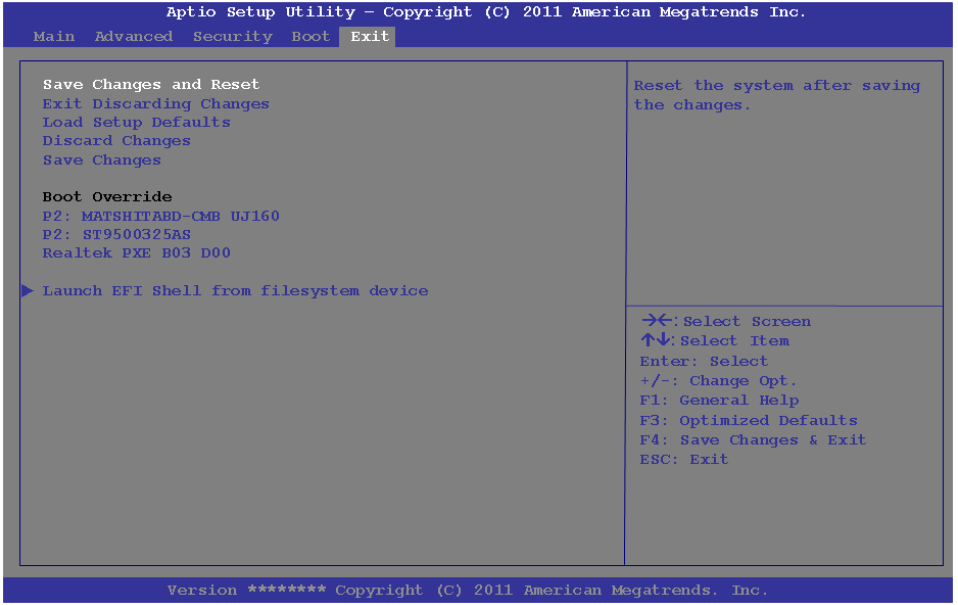


Figure 5 - 6
Exit Menu

Click ***Save Changes and Reset*** to save all changes made. Choosing to ***Discard Changes***, or ***Exit Discarding Changes***, will wipe out any changes you have made to the ***Setup***. You can also choose to restore the original ***Setup*** defaults that will return the ***Setup*** to its original state, and erase any previous changes you have made in a previous session.

Chapter 6: Upgrading The Computer

Overview

This chapter contains information on upgrading the computer. Follow the steps outlined to make the desired upgrades. If you have any trouble or problems you can contact your service representative for further help. Before you begin you will need:

- A small crosshead or Phillips screwdriver
- A small regular slotted (flathead) screwdriver
- An antistatic wrist strap

Before working with the internal components you will need to wear an antistatic wrist strap to ground yourself because static electricity may damage the components.

The chapter includes:

- Removing the Battery
- Removing the Component Bay Cover
- Upgrading the Hard Disk Drive(s)
- Removing the Optical Device Drive
- Upgrading the System Memory (RAM)

Please make sure that you review each procedure before you perform it.



Warranty Warning

Please check with your service representative before undertaking any upgrade procedures to find out if this will VOID your warranty.

Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines).

You must also remove your battery in order to prevent accidentally turning the machine on. **Before removing the battery disconnect the AC/DC adapter from the computer .**

When Not to Upgrade

These procedures involve opening the system's case, adding and sometimes replacing parts.You should **not** perform any of these upgrades if:

- Your system is still under warranty or a service contract
- You don't have all the necessary equipment
- You're not in the correct environment
- You doubt your abilities

Under any of these conditions, contact your service representative to purchase or replace the component(s).

Removal Warning

When removing any cover(s) and screw(s) for the purposes of device upgrade, remember to replace the cover(s) and screw(s) before turning restoring power to the system.

Also note the following when the cover is removed:

- Hazardous moving parts.
- Keep away from moving fan blades.

Upgrading the Processor

If you want to upgrade your computer by replacing the existing processor with a faster/new one you will need to contact your customer service representative. We recommend that you do not do this yourself, since if it is done incorrectly you may damage the processor or mainboard.

Warranty Warning

Please check with your service representative before undertaking any upgrade procedures to find out if this will VOID your warranty.

Removing the Battery

If you are confident in undertaking upgrade procedures yourself, for safety reasons it is best to remove the battery. **Before removing the battery disconnect the AC/DC adapter from the computer first**.

1. Turn the computer off, remove the AC/DC adapter and turn it over.
2. Slide the latch 1 in the direction of the arrow.
3. Slide the latch 2 in the direction of the arrow and the battery will pop up.
4. Lift the battery 3 out of the compartment.

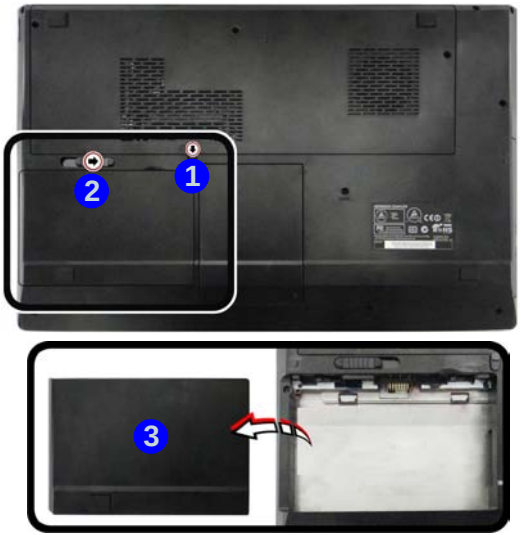


Figure 6 - 1
Battery Removal

Removing the Component Bay Cover

1. Turn **off** the computer, and turn it over and remove the battery.
2. Locate the component bay cover and remove screws 1 - 3
3. Slide the cover in the direction of arrow 4, until the case markers 5 line up.
4. Remove the component bay cover 6.

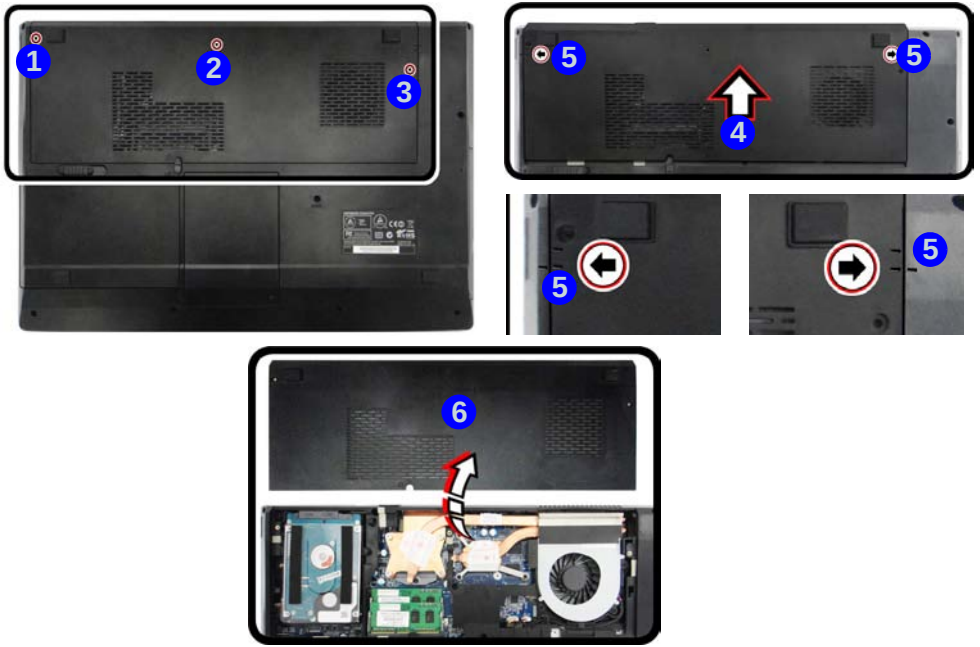
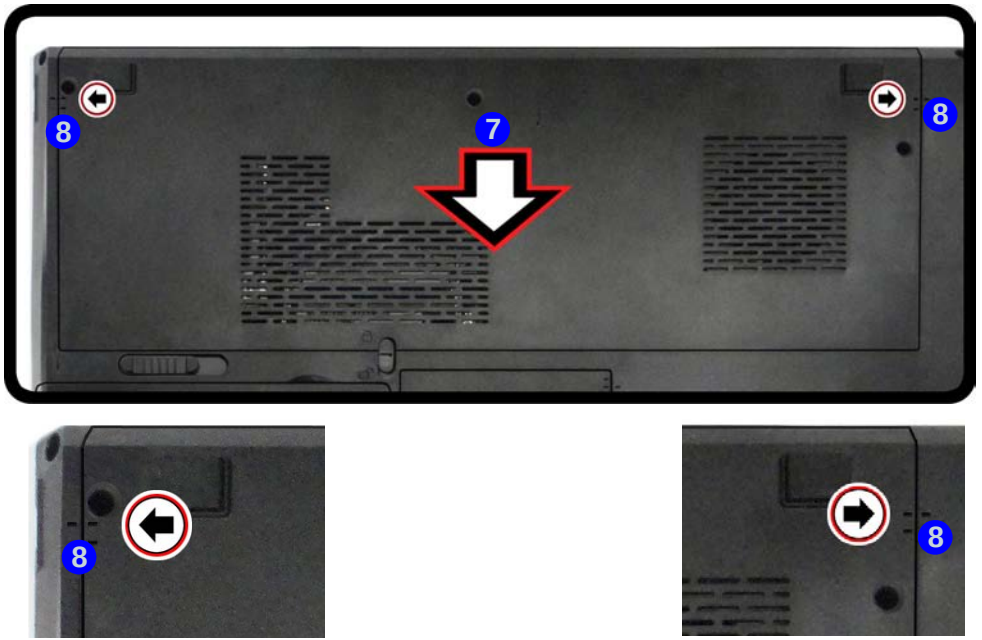


Figure 6 - 2
Component Bay Cover Removal

Replacing the Component Bay Cover

1. Reinsert the component bay cover by placing it on the bottom case assembly and sliding it on to the case in the direction of arrow 7.
2. Make sure the case markers 7 line up.
3. Replace screws 1 - 3 (*Figure 6 - 2 on page 6 - 5*).

Figure 6 - 3
Component Bay Cover Replacement



Upgrading the Hard Disk Drive(s)

The hard disk Drive(s) can be taken out to accommodate up to two other 2.5" serial (SATA) hard disk drives with a height of 9.5mm (h) (see *"Storage" on page D - 4*). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in *"Drivers & Utilities" on page 4 - 1*), when setting up a new hard disk.



HDD System Warning

New HDD's are blank. Before you begin make sure:
You have backed up any data you want to keep from your old HDD.
You have all the CD-ROMs and FDDs required to install your operating system and programs.
If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.

Removing the Hard Disk from the Primary HDD Bay

1. Turn **off** the computer, and turn it over and remove the battery (see page *6 - 4*).
2. Remove screw 1.
3. Slide the HDD cover in the direction of arrow 2 until the case markers line up.
4. Lift the HDD cover out of the computer 3.



Figure 6 - 4
Primary HDD Cover Removal

5. Slide the hard disk assembly 4 forward, and remove the assembly from the computer.
6. Remove screws 5 & 6 and the **primary HDD** insulation plate 7.
7. Reverse the process to install a new disk and do not forget to reinstall the insulation plate.
8. Replace the component bay cover (see page *6 - 6*).



HDD Insulation Plates

Note that the HDD insulation plates for the **primary** and **secondary** hard disks, though similar in outward appearance, are NOT interchangeable. The plates are clearly marked 1ST HDD & 2nd HDD.

Make sure you use the appropriate insulation plate for the HDD as the sizes are slightly different

Figure 6 - 5
Primary Hard Disk Insulation Plate Removal

HDD Insulation Plates

Note that the HDD insulation plates for the **primary** and **secondary** hard disks, though similar in outward appearance, are NOT interchangeable. The plates are clearly marked 1ST HDD & 2nd HDD.

Make sure you use the appropriate insulation plate for the HDD as the sizes are slightly different

Removing the Hard Disk from the Secondary HDD Bay

1. Turn **off** the computer, and turn it over and remove the battery and component bay cover (see pages ***6 - 4*** & ***6 - 5***).
2. Remove screws 1 & 2 from the secondary HDD assembly.
3. Slide the HDD assembly in the direction of arrow 3.
4. Lift the HDD assembly out of the computer 4.

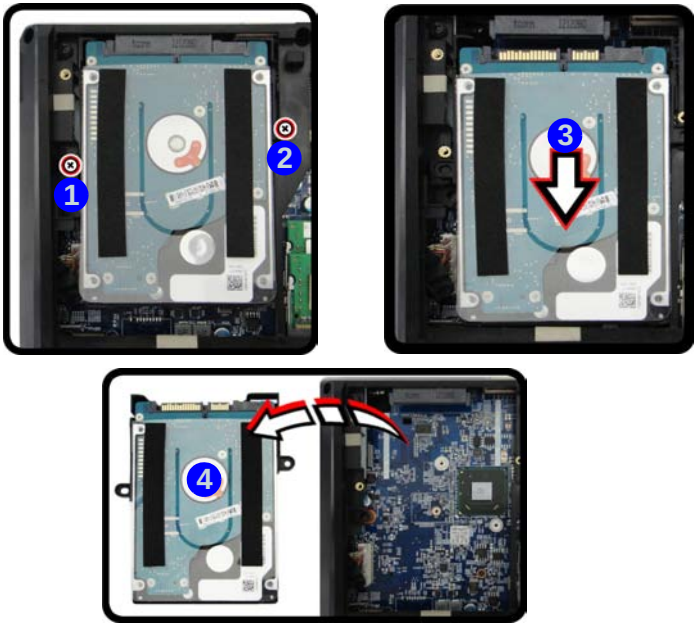


Figure 6 - 6
Secondary HDD Assembly Screws & Removal

5. Remove screws 5 & 6 and separate the case bracket 7 and the insulation plate 8.

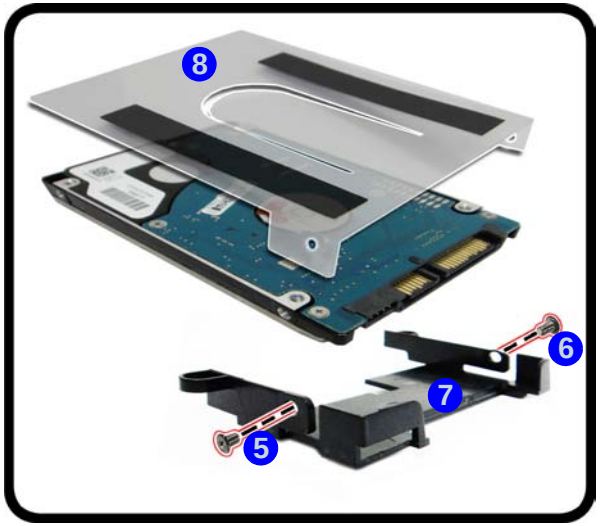


Figure 6 - 7
Secondary Hard Disk Case Bracket & Insulation Plate Removal

6. Reverse the process to install a new disk (pay careful attention to the orientation of the hard disk in the case bracket before tightening the screws).
7. Insert the new HDD into the case along with the insulation plate and replace the crews.
8. Reinsert the HDD assembly back into the case and replace the screws 1 & 2 (***Figure 6 - 6 on page 6 - 10***).
9. Replace the component bay cover (see page ***6 - 6***).

Removing the Optical Device Drive

1. Turn **off** the computer, and turn it over and remove the battery and component bay cover (see pages ***6 - 4*** & ***6 - 5***).
2. Remove the screw at point 1, and use a screwdriver to carefully push out the optical device at point 2.



Figure 6 - 8
Removing the Optical Device

3. Reverse the process to install the new device.
4. Replace the component bay cover (see page ***6 - 6***).

Upgrading the System Memory (RAM)

The computer has **two** memory sockets for 204 pin Small Outline Dual In-line (SO-DIMM) **DDR III (DDR3)** type memory modules (see ***"Memory" on page D - 3***). The total memory size is automatically detected by the POST routine once you turn on your computer.

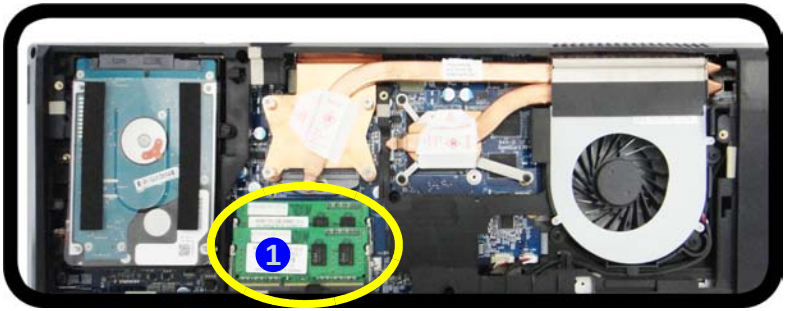
Note that **three SO-DIMMs are only supported by Quad-Core CPUs**; **Dual-Core CPUs support two SO-DIMMs maximum (see *"Memory" on page D - 3* for full details).**

Two primary memory sockets are located under component bay cover (the bottom case cover), and secondary memory socket is located under the keyboard (and is not user upgradable). If you are installing only two RAM modules then they should be installed in the primary memory sockets under the component bay cover.

Note that the RAM located under the keyboard is not user upgradable. Contact your service center for more information if you wish to upgrade the memory in the secondary memory sockets.

1. Turn **off** the computer, and turn it over and remove the battery and component bay cover (see pages ***6 - 4*** & ***6 - 5***).
2. The memory sockets will be visible at point 1 on the mainboard.

Figure 6 - 9
RAM Module Location

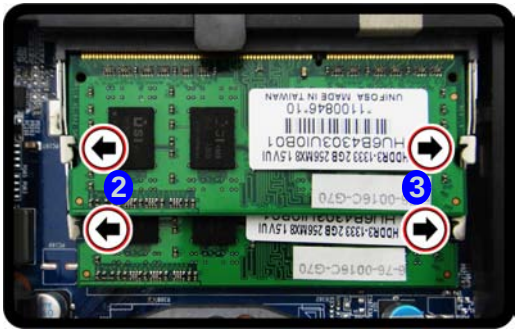


Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

3. Gently pull the two release latches (2 & 3) on the sides of the memory sockets) in the direction indicated below.

Figure 6 - 10
RAM Module Release Latches



4. The RAM module will 4 pop-up, and you can remove it.



Figure 6 - 11
RAM Module Removal

Single Memory Module Installation

If your computer has a single memory module, then insert the module into the **Channel 0 (JDIMM1)** socket. In this case this is the **lower memory socket** (the socket closest to the mainboard).

Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

5. Pull the latches to release the second module if necessary.
6. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory socket.
7. The module's pin alignment will allow it to only fit one way. Make sure the module is seated as far into the socket as it will go. DO NOT FORCE the module; it should fit without much pressure.
8. Press the module in and down towards the mainboard until the socket levers click into place to secure the module.
9. Replace the component bay cover (see page ***6 - 6***).

Chapter 7: Modules

Overview

This chapter contains the information on the various modules (some of which are **optional**) which may come with your computer, depending on the configuration purchased. If you are unsure please contact your service representative.

The chapter includes information on the following:

- Setting Up SATA RAID or AHCI Mode
- PC Camera Module
- Wireless LAN Module
- Intel® Wireless Display Application
- Bluetooth Module
- THX TruStudio Pro Audio
- Intel® Rapid Storage Technology Driver
- Intel® Rapid Start Technology Driver

Setting Up SATA RAID or AHCI Mode

RAID Hard Disks

All hard disks in a RAID should be identical (the same size and brand) in order to prevent unexpected system behavior.

SATA Mode Selection

The SATA mode selection should be made **before installing your operating system**.

DO NOT change your selected SATA mode unless you intend to reinstall your operating system. Make sure you have backed up all your data before doing so.

AHCI Mode

Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced serial ATA features such as Native Command Queuing (for maximum hard disk efficiency and performance). AHCI mode can be supported by one or two hard disks. Make sure you install the **Intel® Rapid Storage Technology** application if you have set up your hard disk(s) in **AHCI** mode (see *"Intel Rapid Storage Technology" on page 7 - 9*)

RAID

To configure your RAID (Redundant Array of Independent Disks) system in Striping (RAID 0), Mirroring (RAID 1) or Recovery modes (see *Table 7 - 1, on page 7 - 3*) you will require **at least two identical** (see sidebar) hard disks. Note that if you are using **Advanced format hard disks that have a 4KB physical sector size**, and you are **installing** a ***Windows 7*** release pre **Service Pack 1**, you will need to install a driver from the ***Device Drivers & Utilities + User's Manual disc*** at OS installation (**see page** *8 - 20*).

Intel® Rapid Storage Technology Application

Make sure you install the **Intel® Rapid Storage Technology** application if you have set up your hard disk(s) in **RAID** mode (see *"Intel Rapid Storage Technology" on page 7 - 9*).

RAID Level	Description
RAID 0	Identical drives reading and writing data in parallel to **increase performance**. RAID 0 implements a striped disk array and the data is broken into blocks and each block is written to a separate disk drive.
RAID 1	Identical drives in a mirrored configuration used to **protect data**. Should a drive that is part of a mirrored array fail, the mirrored drive (which contains identical data) will handle all the data. When a new replacement drive is installed, data to the new drive is rebuilt from the mirrored drive to restore fault tolerance.
Recovery	Two Identical drives copying data between a master and a recovery disk. This provides more control over how data is copied between the master and recovery drives, fast volume updates and the ability to view the data in *Windows Explorer*.

Table 7 - 1
RAID Levels



SATA Mode Selection

The SATA mode selection should be made **before installing your operating system**.

DO NOT change your selected SATA mode unless you intend to reinstall your operating system. Make sure you have backed up all your data before doing so.



Array Types

A **Mirrored Array** (**RAID 1**) provides full data protection, as data can simply be copied from a healthy disk to a replacement for any failed disk.

A **Striped Array** (**RAID 0**) is **NOT** fault-tolerant. The failure of one drive will result in the loss of all data in the array. It is de-signed to increase disk performance by spreading the I/O load across the channels and drives.

Prepare the following before setting up your serial ATA hard disks in **RAID** mode:

1. The ***Microsoft Windows 7 OS DVD***.
2. A hard disk installed in the Primary HDD bay.
   AND
   A **second** (identical) hard disk installed in the Secondary HDD bay.
3. The ***Device Drivers & Utilities + User's Manual*** disc.

Note that if you are using **Advanced format hard disks that have a 4KB physical sector size**, and you are **installing** a ***Windows 7*** release pre **Service Pack 1**, you will need to install a driver from the ***Device Drivers & Utilities + User's Manual disc*** at OS installation (**see page *8 - 20***).

SATA RAID Setup Procedure (BIOS)

1. Start-up your notebook computer and press <**F2**> to enter the **BIOS**.
2. Go to the **Advanced** menu, select "**SATA Mode**" and press Enter (see page ***5 - 9***).

- Select "**RAID Mode**".

3. Press **Esc** and go to the **Boot** menu.
4. Set the ***DVD-ROM Drive*** (make sure the ***Microsoft Windows 7 OS DVD*** is inserted) as the first device in the boot order from the **Boot** menu (see ***"Boot Menu" on page 5 - 13***).
5. Select **Save Changes and Exit** from the **Exit** menu (or press **F4** and Enter) and press **Enter** to exit the BIOS and reboot the computer.
6. See the instructions in ***"RAID Setup (Intel Matrix)" on page 7 - 6***.

RAID Setup (Intel Matrix)

1. As the computer starts up press **Ctrl + i** to enter RAID configuration menu.

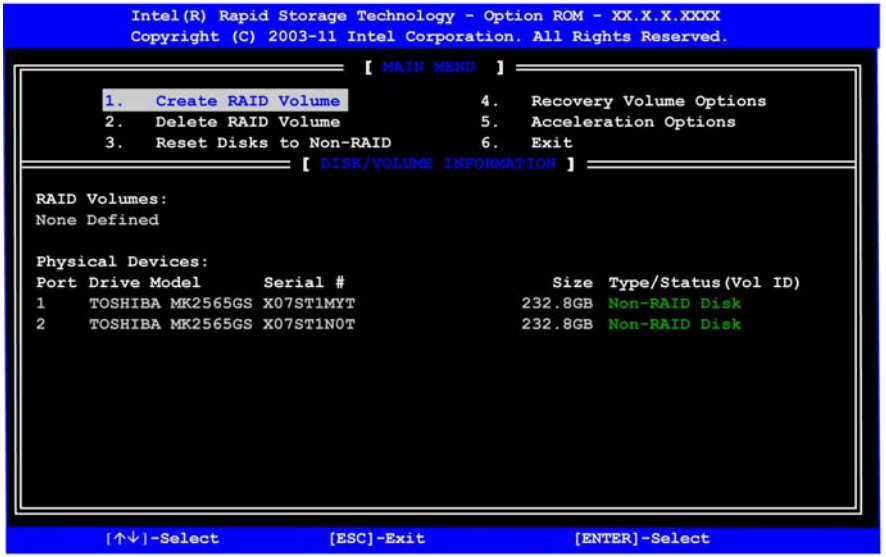


Figure 7 - 1
Intel(R) Rapid Storage Technology Option ROM

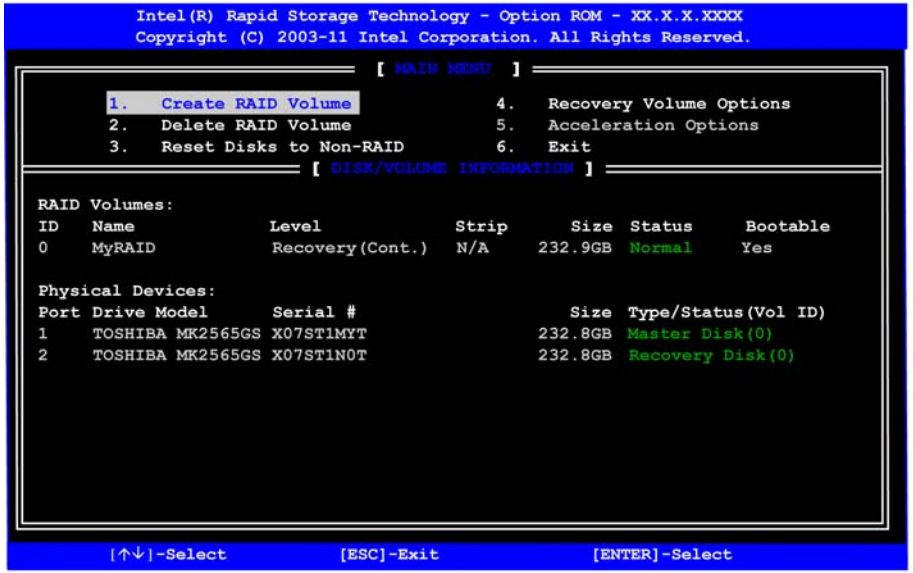
2. Select **1.Create RAID Volume** and press Enter.
3. Type the **RAID volume name** and then press Tab or Enter to advance to the next field.
4. Specify (use the up and down arrow keys) the **RAID level** (**RAID 0, RAID 1 or Recovery** - see ***Table 7 - 1, on page 7 - 3***) and then press Tab or Enter to advance to the next field.

Recovery Level

When selecting disks for the Recovery RAID level you will need to use the **Tab** key to select a **Master** disk, and the **Space** key to select a **Recovery** disk.

You can select the synchronization between the disks to be **Continuous** (automatic) or **On Request** (manually).

5. Press Enter and the system will select the physical disks to use (see sidebar for **Recovery** Level).
6. Press Enter and select (if applicable) the Strip Size (best set to default).
7. Press Enter and select the Capacity size (best set to default).
8. Press Enter to select **Create Volume**.
9. Press Enter to create the volume, and confirm the selection by pressing **Y**.
10. This will now return to the main menu.



11. Select **6.Exit** and press Enter, then press **Y** to exit the RAID configuration menu.

Recovery Level

When selecting disks for the Recovery RAID level you will need to use the **Tab** key to select a **Master** disk, and the **Space** key to select a **Recovery** disk.

You can select the synchronization between the disks to be **Continuous** (automatic) or **On Request** (manually).

Figure 7 - 2
RAID Created



Win7 (pre SP1) & Advanced Format Disks in a RAID

Note that if you are installing a **Windows 7** OS **pre Service Pack 1**, and you are using **Advanced format hard disks that have a 4KB physical sector size,** you will need to install a driver from the ***Device Drivers & Utilities + User's Manual disc*** at OS installation (see page ***8 - 20***).

12. Make sure the ***Windows 7*** OS DVD is in the DVD drive. and as the computer starts up it will automatically boot from the ***Windows 7*** OS DVD (you will be prompted to press a key to boot from the DVD).
13. Press **Enter** to continue installing the operating system as normal (see your ***Windows*** documentation if you need help on installing the ***Windows*** OS - see sidebar).
14. Install the ***Windows*** drivers from the ***Device Drivers & Utilities + User's Manual*** disc as per ***Table 4 - 1, on page 4 - 3*** (make sure you install the Intel Rapid Storage Technology driver - see ***"IRST Driver Installation" on page 7 - 9***).

Intel Rapid Storage Technology

The **Intel Rapid Storage Technology application** provides high-performance SATA and SATA RAID capabilities. Install the **Intel Rapid Storage Technology application** (after installing all necessary drivers in the correct order) to support your **RAID** system or SATA drive if set up in **AHCI mode** in the BIOS (see ***"SATA Mode (Advanced Menu)" on page 5 - 9***).

IRST Driver Installation

1. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Option Drivers** (button).
3. Click **8.Install IRST Driver** > **Yes**.
4. Click **Next** > **Next** > **Yes** > **Next** > **Next**.
5. Click **Finish** to restart the computer (you will need to restart the system again after the computer has rebooted).

See the following pages for more information if you have set your hard disks up in a RAID configuration.

Intel® Rapid Storage Technology for RAID Systems

Intel® Rapid Storage Technology application displays status information on your RAID configuration. Run the **Intel® Rapid Storage Technology** application from the **Intel** item in the **All Programs** menu.

When the **Intel® Rapid Storage Technology** application is launched the system will open the **Status** window. Here you can view the general health of the storage system. Various volume creation and management options are available depending on the system's status.

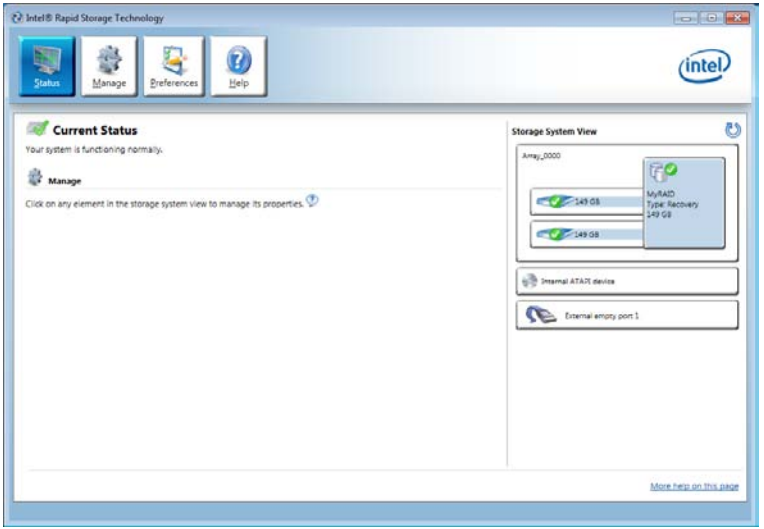
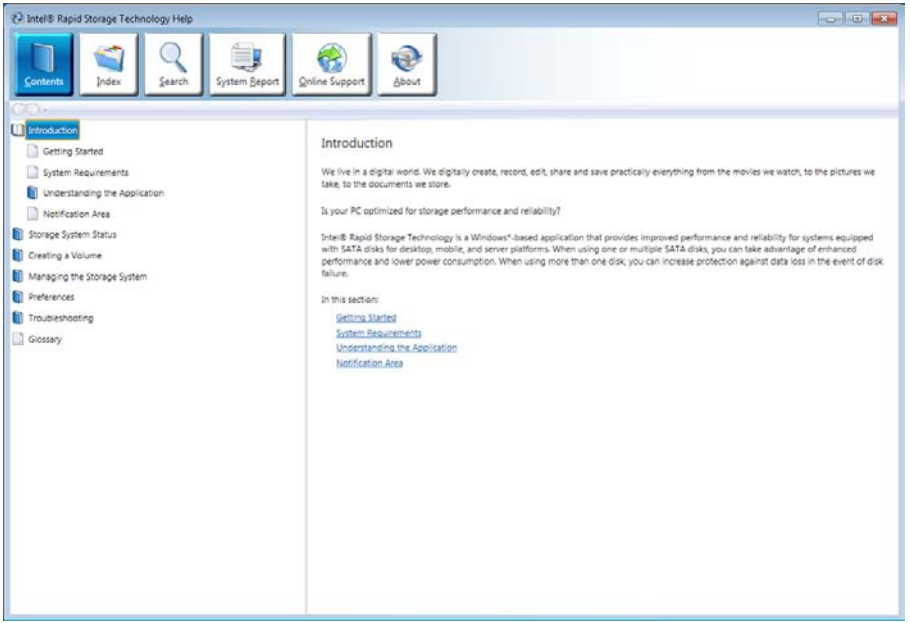


Figure 7 - 3
Intel® Rapid Storage Technology Status

Intel® Rapid Storage Technology Help

If a hard drive member of a RAID volume is reported as "**Degraded**" or "**Failed**" it may be possible to recover the volume. If the volume cannot be restored then you will need to recreate the RAID volume and restore the data from a back up. Click the **Help** menu (or press **F1**) for instructions on how to recover or recreate RAID Volumes.



Help

Click the **Help** (or press **F1**) menu button at the top of the **Intel® Rapid Storage Technology** application.

Click **Contents** to view the general list of subjects covered, click **Index** or **Search** for a more specific help topics on a particular item.

Click **More help on this page** at the bottom of any page for page specific help.

Figure 7 - 4
Intel® Rapid Storage Technology Help

RAID Volume Data Verification and Repair

The RAID volume data verification process identifies any inconsistencies or bad data on a RAID 0 or RAID 1 volume. The table outlines what occurs for each RAID level:

Table 7 - 2
RAID Level Verification & Repair Status

RAID Level	Verify	Verify & Repair
RAID 0	Bad blocks are identified.	N/A
RAID 1	Bad blocks are identified. Data on the mirrored drive is compared to data on the source drive.	Bad blocks are reassigned. If the data on the mirrored drive does not match the data on the source drive, the data on the mirrored drive is overwritten by the data on the source.

Replacing and Reverting Recovery and Master Volumes

If a master or recovery drive fails you will need to add a new identical drive and re-build the recovery volume to the drive. You can also revert the master drive to the state of the previous volume update. For details on how to do this see the help file *"Intel® Rapid Storage Technology Help" on page 7 - 11*.

See over for details on how to verify and repair RAID volume data. Verification will identify and repair data inconsistencies on the volume.

Verifying and Repairing RAID Volume Data

1. Before verifying the volume data you will need to initialize the volume.
2. Run the **Intel® Rapid Storage Technology** application from the **Intel** item in the **Programs/All Programs** menu.
3. Click **Manage** and click **Advanced**.
4. Click **Initialize** and click **Yes** (button) to begin the process.
5. The completion percentage will be listed under **Status**.

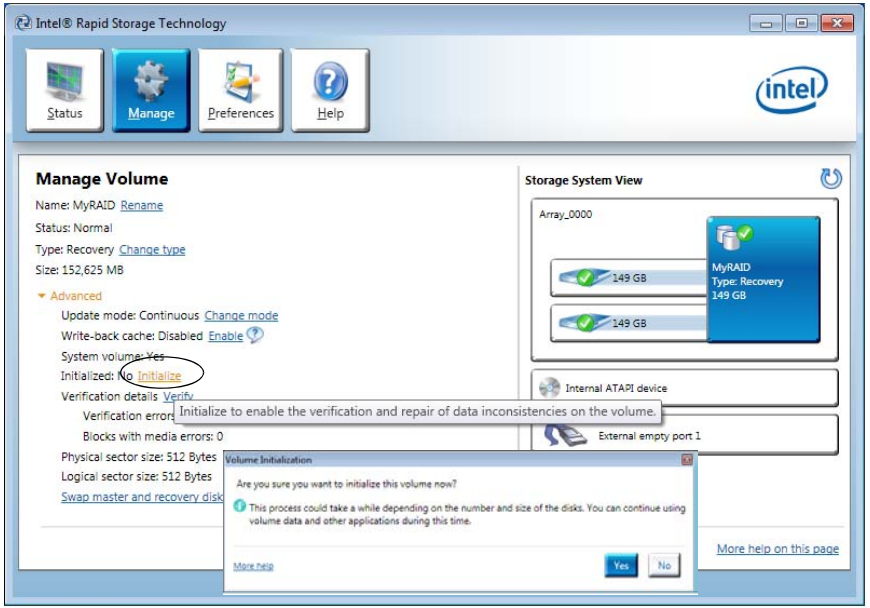


Figure 7 - 5
Intel® Rapid Storage Technology Initialize

6. Click **Advanced** and click **Verify**, then click **Verify** (button) to begin the process.
7. The completion percentage will be listed under **Status** (verifying and repairing).

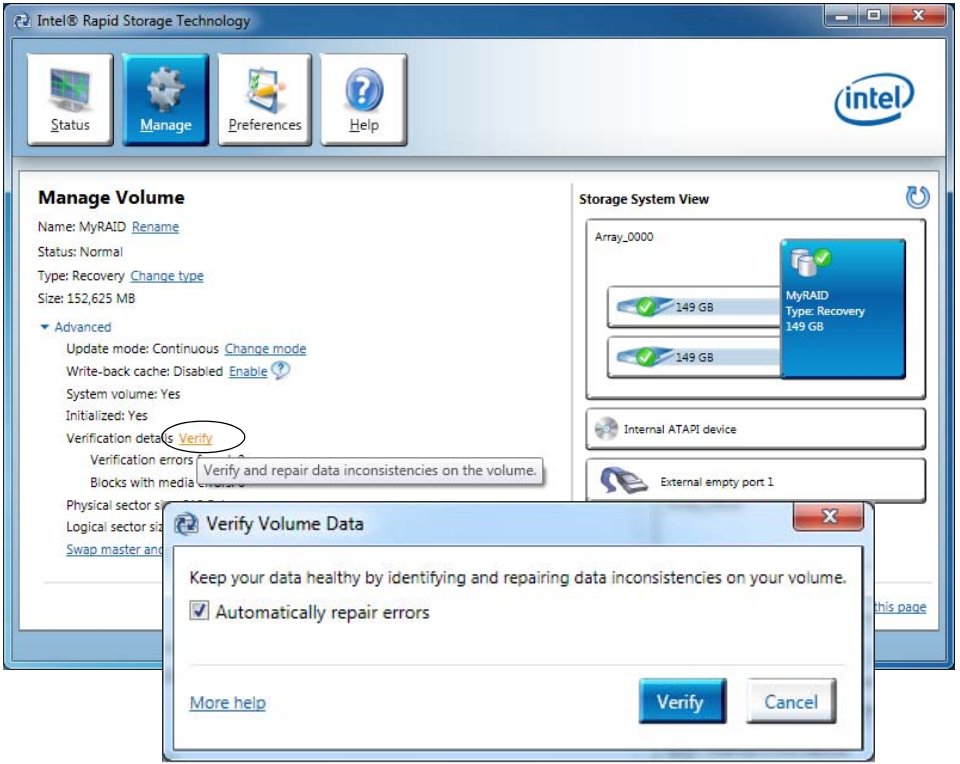


Figure 7 - 6
Intel® Rapid Storage Technology Verify

PC Camera Module

Before installing the driver, make sure the PC Camera is on. **Use the Fn + F10 key combination**, or Control Center button, to toggle power to the to the PC Camera module. Make sure you install the drivers in the order indicated in *Table 4 - 1, on page 4 - 3*.

There are a number of different camera modules available with this computer model series. You will have the appropriate application installed for your camera. **Make sure you access the application via the desktop shortcut**.



PC Camera Application and Power-Saving States

If the computer enters **Sleep** or **Hibernate** mode while running the camera application, the program will stop running, and will need to be restarted when the system resumes from the power-saving state.



Latest PC Camera Driver Information

Check the ***Device Drivers & Utilities + User's Manual disc*** and any accompanying insert pages, for the latest updated information on the PC Camera driver, which may override the information provided here.

PC Camera Display

The PC Camera application software needs to be run while the ***default notebook LCD*** is the selected display device.

After a camera picture is obtained on the default notebook LCD, you may then use the **Fn + F7** to toggle through the display modes (give the screen time to refresh).

PC Camera Driver Installation

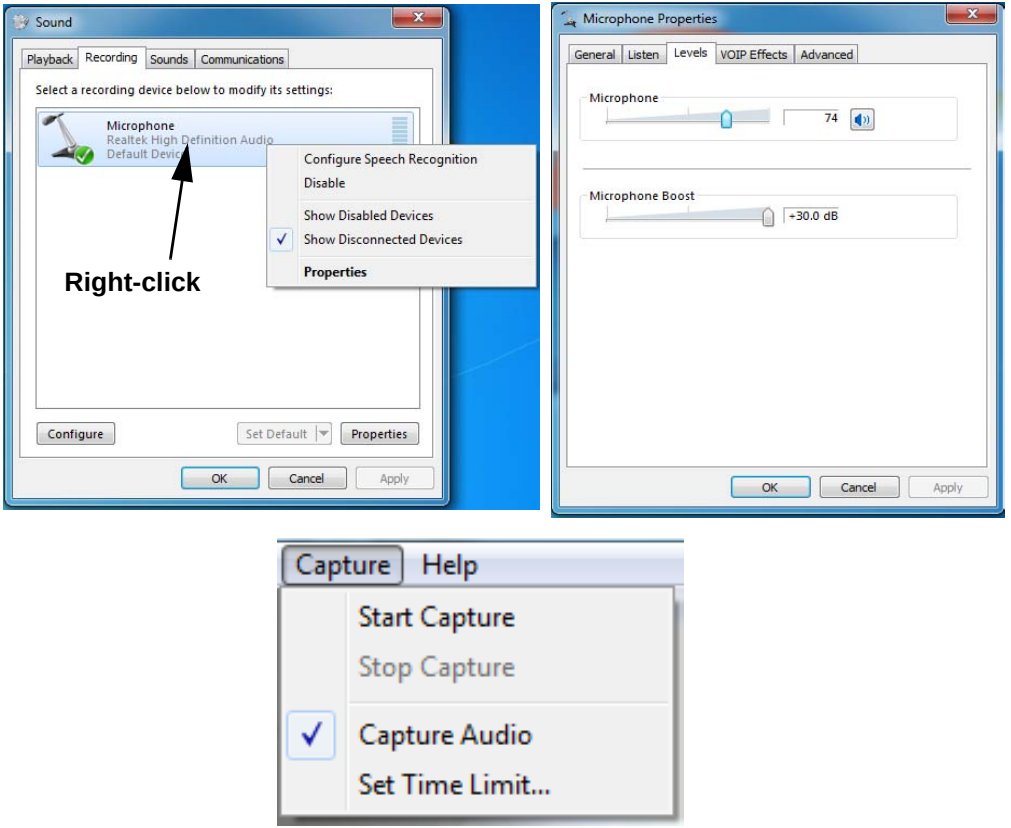
1. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Option Drivers** (button).
3. Click **1.Install Webcam Driver** > **Yes**.
4. Click **Finish** to restart the computer.
5. Run the camera application program from the desktop shortcut (if the hardware is turned off use the **Fn + F10** key combination, Control Center button or camera hot key button to turn it on again).

PC Camera Audio Setup

If you wish to capture video & **audio** with your camera, it is necessary to setup the audio recording options in ***Windows***.

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**).
2. Click **Sound** (**Hardware and Sound**).
3. Click **Recording** (tab).
4. Right-click **Microphone** (Realtek High Definition Audio) and make sure the item is not disabled.
5. Double-click **Microphone** (or select **Properties** from the right-click menu).
6. Click **Levels** (tab), and adjust the **Microphone** and **Microphone Boost** sliders to the level required.
7. Click **OK** and close the control panels.
8. Run the camera application program from the desktop shortcut.
9. Go to the **Devices** menu heading and select **Microphone** (**Realtek....**) (it should have a tick alongside it).
10. Go to the **Capture** menu heading and select **Capture Audio** (it should have a tick alongside it).
11. To obtain the best sound recording quality enable **Noise Suppression** in the **Realtek HD Audio Manager** control panel (see ***"Setup for Audio Recording" on page 2 - 8***).

Figure 7 - 7
Audio Setup for PC Camera



Camera Application

The camera application is a video viewer for general purpose video viewing and testing, and for capturing video files to .avi format.

1. Run the camera application from the desktop shortcut (it is recommended that you **set the capture file** before the capture process - **see below**).
2. Go to the **Capture** menu heading (if you wish to capture audio check *"PC Camera Audio Setup" on page 7 - 17*) and select **Start Capture**.
3. Click **OK/Yes** (the file location will be displayed in the pop-up box) to start capturing the video, and press **Esc** to stop the capture (you can view the file using the **Windows Media Player**).

Set Capture File

Prior to capturing video files you may select the **Set Capture File...** option in the **File** menu, and set the file name and location before capture (this will help avoid accidentally overwriting files). Set the name and location then click **Open**, then set the **"Capture file size:"** and click **OK**. You can then start the capture process as on the previous page.

Note the important information in *"Reducing Video File Size" on page 7 - 20* in order to save file space, and help prevent system problems.

Reducing Video File Size

Note that capturing high resolution video files requires a substantial amount of disk space for each file. After recording video, check the video file size (right-click the file and select **Properties**) and the remaining free space on your hard disk (go to **My Computer**, right-click the hard disk, and select **Properties**). If necessary you can remove the recorded video file to a removable medium e.g. CD, DVD or USB Flash drive.

Note that the ***Windows*** system requires a minimum of **15GB** of free space on the **C: drive** system partition. In order to prevent system problems it is recommended that you save the captured video file to a location other than the **C: drive** (see ***"Set Capture File" on page 7 - 19***), limit the file size of the captured video or reduce video resolution (see below).

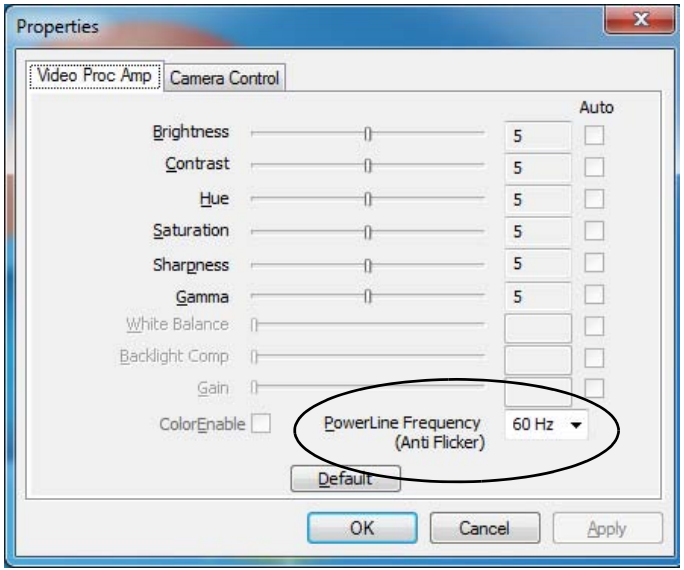
To Reduce Video Resolution Output Size:

1. Run the camera application program from the desktop shortcut.
2. Go to **Options** and scroll down to select **Video Capture Pin...**.
3. Click the **Output Size** drop box and select a lower resolution size in order to reduce the captured file size.
4. Click **OK**.

Eliminating Screen Flicker

If you find that the video screen in the camera program is flickering, you can try to adjust the setting in the **Video Capture Filter** options.

1. Run the camera application from the desktop shortcut.
2. Go to **Options** and scroll down to select **Video Capture Filter...**.
3. Click either **50Hz** or **60Hz** under **PowerLine Frequency**.



Camera Options

The video capture filter figure pictured here may appear slightly different for some camera modules. To adjust the anti flicker properties look under the headings **Anti Flicker/Frequency/PowerLine Frequency**.

Latest PC Camera Driver Information

Check the ***Device Drivers & Utilities + User's Manual disc***, and any accompanying insert pages, for the latest updated information on the PC Camera driver, which may override the information provided here, including the figures pictured here.

Figure 7 - 8
Video Capture Filter

Snapshot Folder

The Snapshot folder's default location is on the desktop. Do not move this folder or an error may appear when you try to take a still picture.

If you accidentally delete or move the folder, you can create a new Snapshot folder on the desktop in order to capture the files.

Taking Still Pictures

The camera application allows you to take still pictures.

1. Run the camera application from the desktop shortcut.
2. Go to **Options** and select **Take Picture**.
3. The picture (in JPEG format) will be placed in the **Snapshot** folder 

on the desktop.

Wireless LAN Module

If you have included an **Intel® or 3rd Party** Wireless LAN (or WLAN & Bluetooth combo) module in your purchase option, make sure that the WLAN module is on before installing the driver.

Use the **Fn + F11** key combination, Control Center button or WLAN hot key button to toggle power to the Wireless LAN module. Make sure you install the drivers in the order indicated in ***Table 4 - 1, on page 4 - 3***. The operating system is the default setting for Wireless LAN control in ***Windows 7***.

Note that you need to install both the WLAN & Bluetooth drivers for the WLAN & Bluetooth Combo modules.



Wireless Device Operation Aboard Aircraft

The use of any portable electronic transmission devices aboard aircraft is usually prohibited. Make sure the module(s) are OFF if you are using the computer aboard aircraft.

Use the **Fn + F11** key combination to toggle power to the WLAN module, and check the LED to see if the module is powered on or not (see ***Table 1 - 4, on page 1 - 11***/***Table 1 - 2, on page 1 - 8***).

3rd Party WLAN Driver Installation (for WLAN Module)

This information applies to 3rd party WLAN modules only. See over for information on installing the drivers for the 3rd party WLAN & Bluetooth combo modules.

If you see the message "**Found New Hardware**" click **Cancel** to close the window.

1. **Make sure the module is powered on**, and then insert the ***Device Drivers & Utilities + User's Manual*** disc into an attached DVD drive.
2. Click **Option Drivers** (button).
3. Click **2.Install WLAN Driver > Yes**.
4. Choose the language you prefer and click **Next**.
5. Click **Next**.
6. Click **Finish** to restart the computer.

Note: The operating system is the default setting for Wireless LAN control in ***Windows*** (see page *7 - 29*).

3rd Party WLAN Driver Installation (for Combo Module)

This information applies to 3rd party WLAN & Bluetooth combo modules only.

If you see the message "**Found New Hardware**" click **Cancel** to close the window.

1. **Make sure the module is powered on**, and then insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Option Drivers** (button).
3. Click **2.Install WLAN Driver > Yes**.
4. Choose the language you prefer and click **Next > Next**.
5. Click **Finish** to restart the computer.

Note: The operating system is the default setting for Wireless LAN control in ***Windows*** (see page *7 - 29*).

Intel® WLAN Driver Installation

For a standard Intel® WLAN driver installation and configuration choose the **Typical Installation** below and use the ***Windows OS*** for Wireless LAN control (**see overleaf**). If you want to use **Intel® PROSet/Wireless WiFi Connection Utility** as your WLAN interface, and/or add **Intel® MyWifi Technology** (Personal Area Network) see overleaf.

Typical Installation:

1. If you see the message "**Found New Hardware**" click Cancel to close the window.
2. **Make sure the module is powered on**, and then insert the ***Device Drivers & Utilities + User's Manual*** disc into an attached DVD drive.
3. Click **Option Drivers** (button).
4. Click **2.Install WLAN Driver > Yes**.
5. Click **Next > Next**.
6. Click the button to accept the license and click **Next**.
7. Click **Typical > Install**.
8. Click **Finish**.

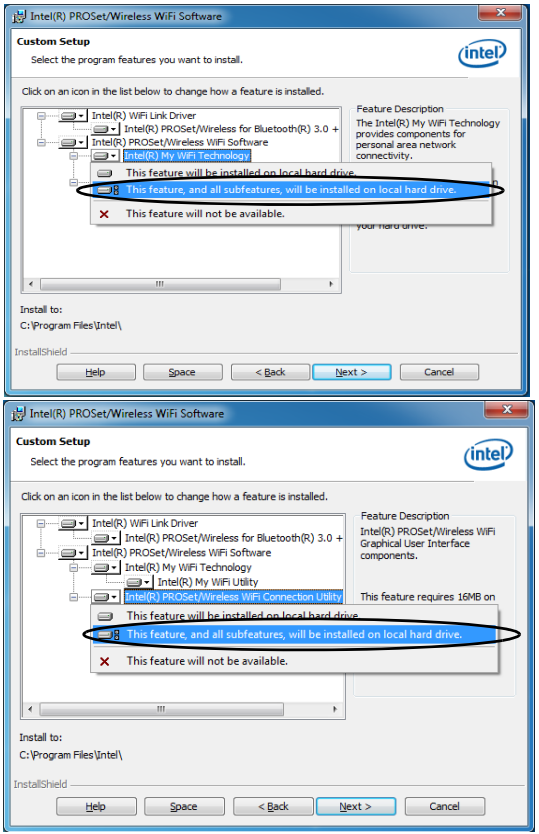
Note: The operating system is the default setting for Wireless LAN control in ***Windows*** (see ***"Connecting to a Wireless Network in Windows 7" on page 7 - 29***).

Custom Installation (for Intel® ProSet and/or Intel® MyWiFi Technology):

Note that if you wish to install Intel® MyWiFi you will need to **install Microsoft.net Framework 4.0 (or later version) before installing the driver** as per the procedure below. To get the **Microsoft.net Framework** file go to the ***Microsoft*** website, search for the file, Download it and then install it.

1. If you see the message "**Found New Hardware**" click Cancel to close the window.
2. **Make sure the module is powered on**, and then insert the ***Device Drivers & Utilities + User's Manual*** disc into an attached DVD drive.
3. Click **Option Drivers** (button).
4. Click **2.Install WLAN Driver > Yes**.
5. Click **Next > Next**.
6. Click the button to accept the license and click **Next** > **Custom**.
7. To install **Intel® MyWiFi Technology** click the icon  alongside **Intel® MyWiFi Technology** and select **"This feature, and all subfeatures, will be installed on local hard drive"** (see ***Figure 7 - 9 on page 7 - 28***).
8. To install **Intel® PROSet/Wireless WiFi Connection Utility** click the icon  alongside it and select **"This feature, and all subfeatures, will be installed on local hard drive"** (see ***Figure 7 - 9 on page 7 - 28***).
9. Click **Next > Install > Finish**.
10. See ***"Connecting to a Wireless Network Using Intel® PROSet Wireless" on page 7 - 32*** or ***"Intel® My WiFi Configuration" on page 7 - 34*** for further information.

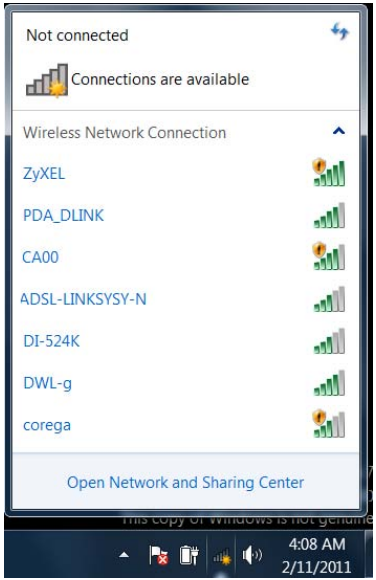
Figure 7 - 9
Install Intel® MyWiFi Technology & Intel® PROSet/Wireless WiFi Connection Utility

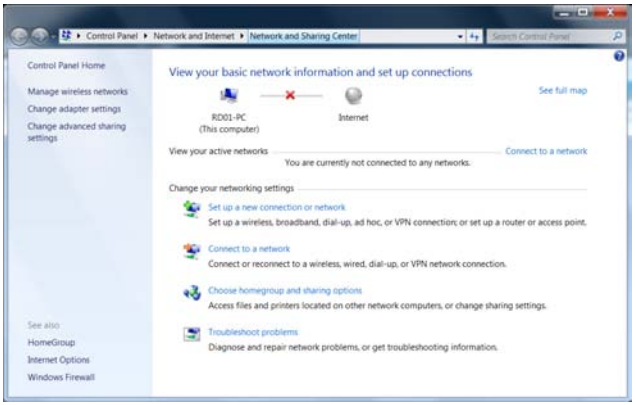


Connecting to a Wireless Network in Windows 7

Make sure the Wireless LAN module is turned on.

1. **Click** the taskbar wireless icon , and then double-click an access point to connect to or click to **Open Network and Sharing Center** if you do not see a network you want to connect to in the taskbar menu (a list of options will appear allowing setting changes, and creating a new network).





Network and Sharing Center

You can also use the **Network and Sharing Center** control panel in Windows (**Network and Internet**) to connect to any available wireless networks.

Figure 7 - 10
Click Taskbar Icon Menu & Network and Sharing Center

2. You may need to enter a security key for any access point to which you are trying to connect.
3. Click to select a network location (e.g. **Home, Work or Public**).
4. Click "**View or change settings in Network and Sharing Center"** to access further options for the connection.

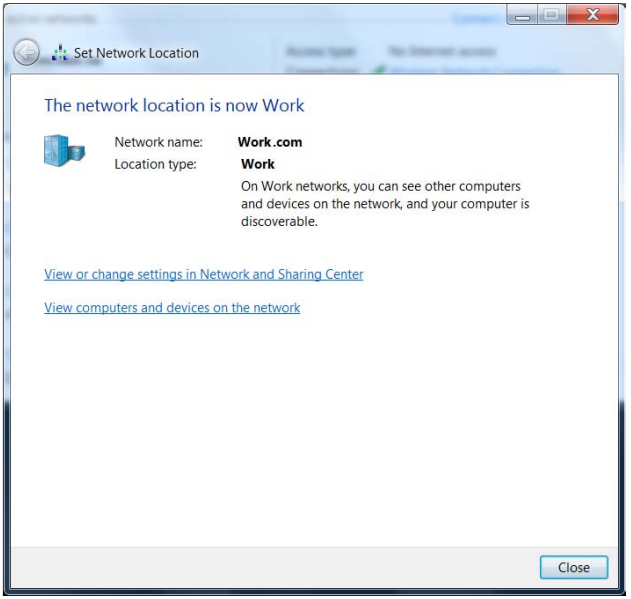


Figure 7 - 11
Network Location Set

5. Click the taskbar icon to see any currently connected networks.
6. To disconnect from the wireless network you can click the taskbar wireless icon, click the active connection and then click **Disconnect** (button).



Security Enabled Networks

You should try to make sure that any network you are connecting to is a secure network.

Connecting to unsecure networks may allow unauthorized access to your computer, documents, websites and files etc.

Figure 7 - 12
Click Taskbar Icon Menu - Disconnect

Connecting to a Wireless Network Using Intel® PROSet Wireless

(For Intel® WLAN Modules Only)

1. Make sure the Wireless LAN module is on.
2. Access the **Intel® WiFi Connection Utility** from the **Start** menu (**Start** > **All Programs** > **Intel PROSet Wireless > WiFi Connection Utility**).
3. Click to select a network from the found list WiFi network access points, or click **Refresh** to update the list.

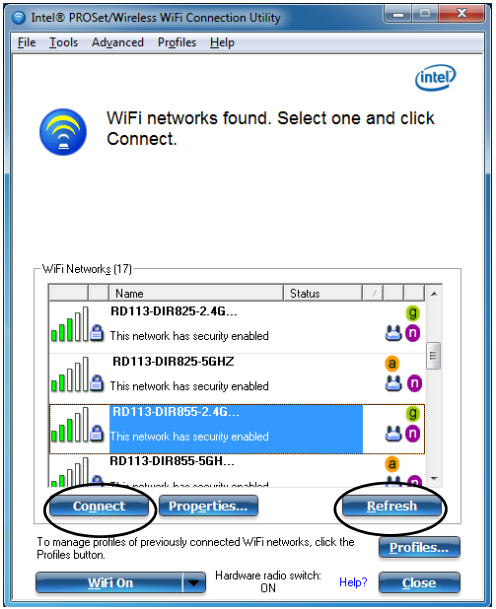


Figure 7 - 13
Intel® PROSet/ Wireless WiFi Connection Utility (Connect)

4. Click **Connect** to connect to the select WiFi network access point.
5. If the access point is encrypted then you will need to enter the password and click **OK**.

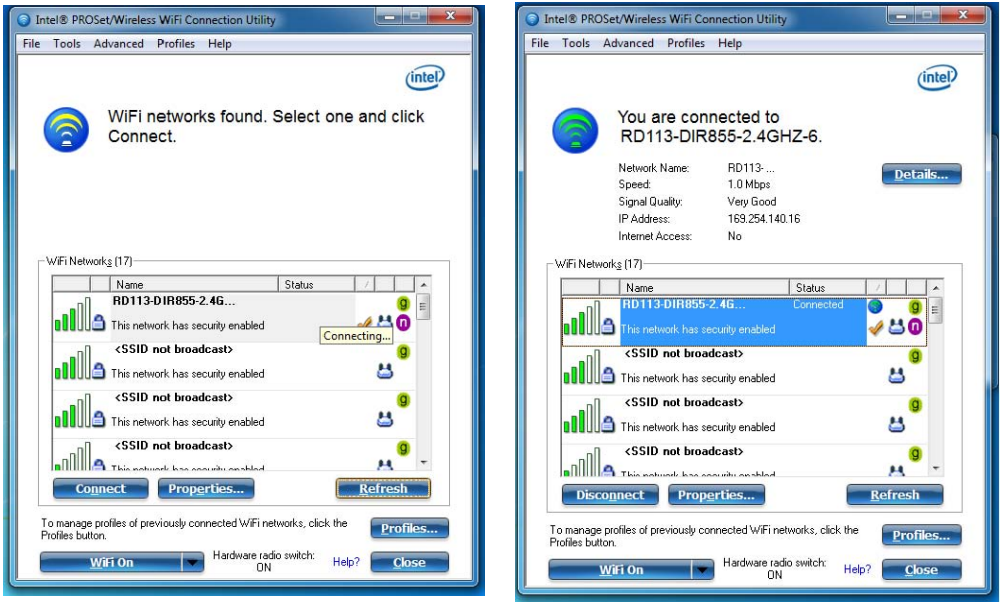


Figure 7 - 14
Intel® PROSet/ Wireless WiFi Connection Utility (Connecting & Connected)

6. You can turn **WiFi On**/**WiFi Off** from the button at the bottom of the Utility.
7. To disconnect, select the connected access point and click **Disconnect**.
8. Select **Help** from the menu at the top of the utility (or at the bottom right) to bring up the **Help** menu.

Intel® My WiFi Help

To get help on **Intel® My WiFi** configuration and settings, access the **Intel® My WiFi Dashboard** from the **Start** menu (**Start > All Programs > Intel PROSet Wireless > Intel(R) My WiFi Dashboard**), or by clicking the taskbar icon. click the **Help** icon in the dashboard and select a help topic from the **Contents** menu.

Intel® My WiFi Configuration

(For Intel® WLAN Modules Only)

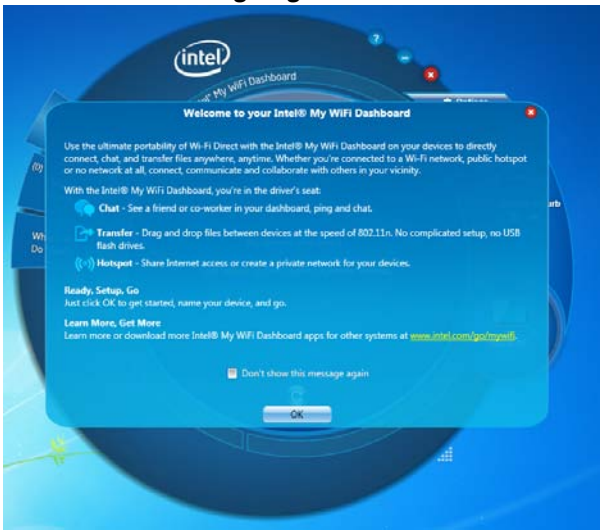
Intel® My WiFi Technology (Intel® MWT) uses your WLAN to transform your system into a WiFi Personal Area Network, and enables you wirelessly share your videos, photos, music with other WiFi enabled devices, while still connecting to the Internet through your WiFi wireless connection.

Intel® MWT also features a chat function, and offers you the option of being able to create a WiFi hotspot from your computer. Intel® MWT offers greater range and speed than other personal area networks, and does not require an access point.

Intel® My WiFi Configuration

You can configure the My WiFi settings as follows.

1. Make sure the Wireless LAN module is on.
2. Access the **Intel® WiFi Connection Utility** from the **Start** menu (**Start** > **All Programs** > **Intel PROSet Wireless > Intel(R) My WiFi Dashboard**), or click the icon in the notification area of the taskbar (or right-click and select Open Dashboard).
3. An initial welcome message will appear on the first run of the program (click "***Don't show this message again***" to turn this off in future).



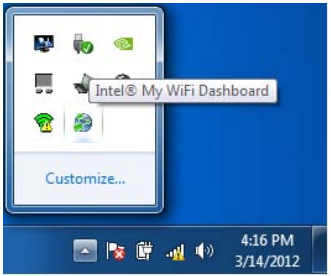
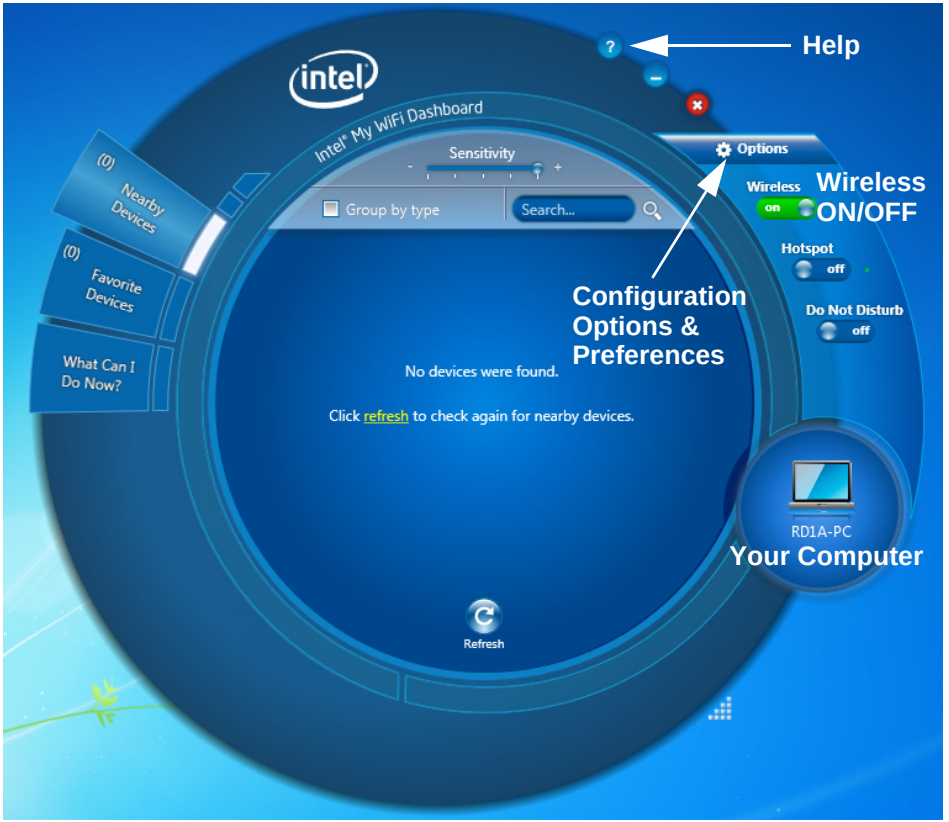




Figure 7 - 15
Intel® My WiFi Utility - Welcome

Figure 7 - 16
Intel® My WiFi Utility - Interface

Intel® My WiFi Interface



Intel® My WiFi Help

Click the **Help** icon in the dashboard to bring up the Help menu and select and item from the **Contents** menu to obtain the help information.

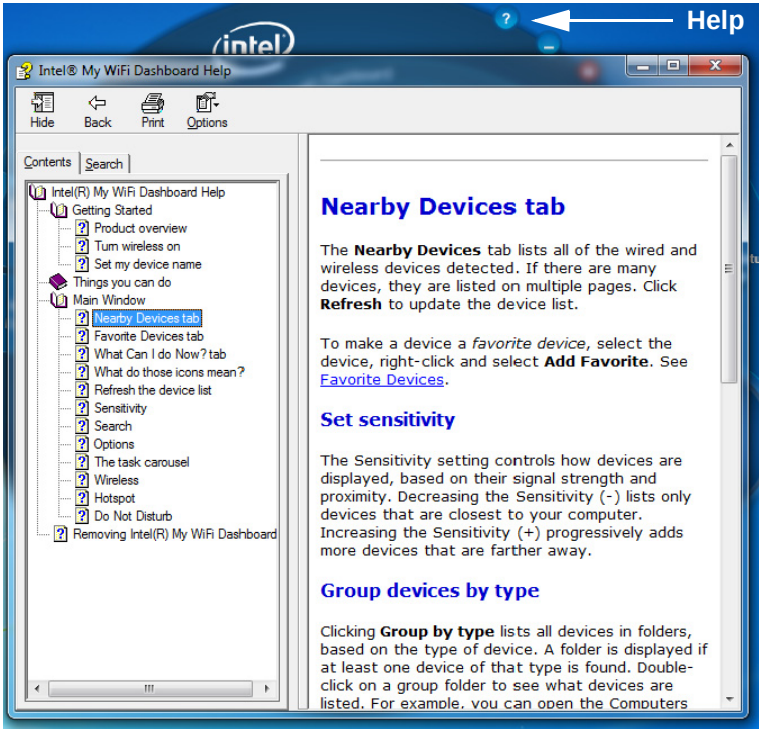


Figure 7 - 17
Intel® My WiFi Utility - Help

Preferences

Click the **Options** icon and select **Preferences** to configure the options.



Figure 7 - 18
Intel® My WiFi Utility - Preferences

Hotspot

You can turn the computer into a hotspot to allow other devices to connect to it (and any locally connected devices), and also (if available) the internet.

1. Click the **Hotspot** icon  to turn the **Hotspot** on.
2. The **Hotspot** settings tab shows the SSID and password (you will need to enter this information when accessing the hotspot from the client computer/device).
3. Click **OK** to close the **Hotspot** settings.

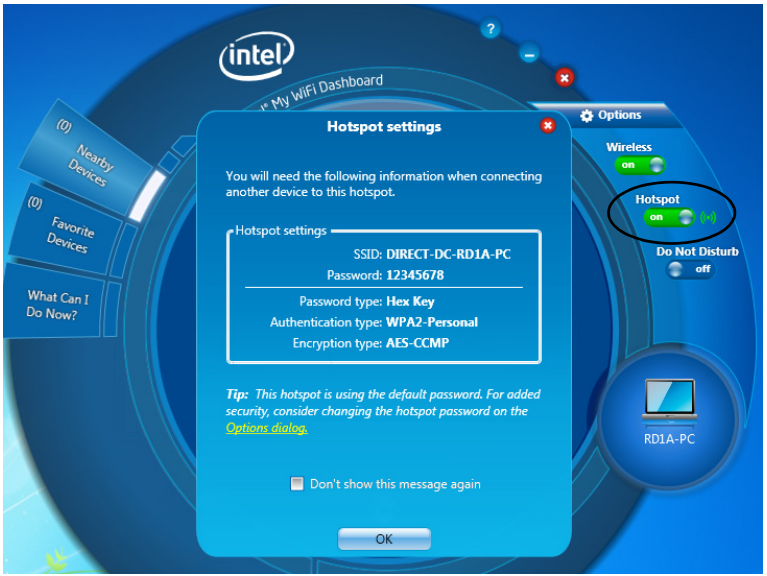


Figure 7 - 19
Intel® My WiFi Utility - Hotspot

Finding Devices

You can find any **Nearby Devices** by clicking the **Refresh** button  in the main window. Click again at any time to update the list. If a lot of devices are found they will be listed on multiple pages and you can use the left  or right  buttons to turn the pages.

Sensitivity

The **Sensitivity** controls displays available devices based on their signal strength and proximity e.g decreasing (-) the sensitivity lists only devices closest to the computer's location.

Group Devices by Type

If you click **Group by type** it will list all devices according to their type in a folder group. Double-click on any group folder to see the devices of that type listed. There are 12 possible device types available.

Search

If you want to search for a particular device by name then enter the device name in the Search field to return results for devices matching the name of the device.

Favorite Devices

The **Favorite Devices** tab is where you keep devices to which you connect most often, and this is particularly useful in environments where many devices are listed nearby. A favorite device will display the icon .

To make any device a favorite just click to select it and select **Add Favorite**.



Figure 7 - 20
Intel® My WiFi Utility - Interface

Connect to a Device

1. Click the device you want to connect to, and click the connect icon  .
2. An invitation will be sent to the target device.
3. The user must then accept the invitation.
4. After the invitation is accepted the connection will be made.
5. Use the ***Windows Network and Sharing Center*** to set permissions for viewing and sharing the resources on your computer with another connected computer.

Further Information

For information on how to **block/unblock** devices, setting **Do Not Disturb**, **sharing an internet connection** and **chat** options see ***"Intel® My WiFi Help" on page 7 - 37***.

Windows Mobility Center

The **Windows Mobility Center** control panel provides an easy point of access for information on battery status, power plans used and wireless device status etc.

To access the Windows Mobility Center:

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**).
2. Double-click **Windows Mobility Center** (**Mobile PC**).
3. Click the button to **Turn wireless off/on**, or click the icon to access the network menu.

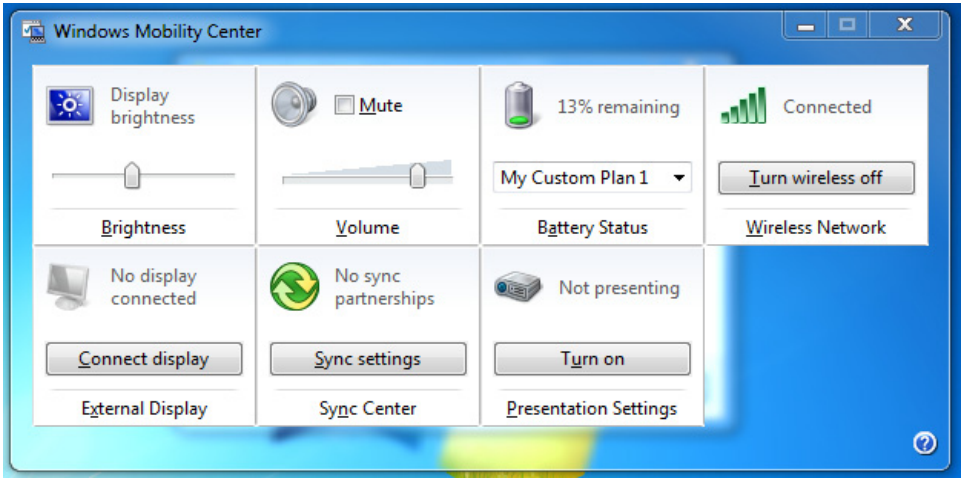


Figure 7 - 21
Windows Mobility Center

Compatible Adapters

For a list of compatible display and audio adapters check the Intel website, or your service center.

Intel® Wireless Display Application

The **Intel® Wireless Display Application (requires Intel® Centrino WLAN/ Combo module)**, in conjunction with a **compatible video adapter** (purchased separately), allows you to display the contents of the notebook display on another display (e.g. HDTV) without the need to have cables stretching across a room. You can then play games, browse the internet, display videos or photo slide shows on your TV/external display without using HDMI or A/V cables.

Before configuring the **Intel® WiDi** application you will need to set up your **compatible adapter** with your display/speakers. Connect the adapter using an HDMI or A/V cable and turn on the display (or in the case of speakers connect them to the wireless speaker adapter with the cables provided with the adapter), and then set the display to the appropriate input channel (see the documentation supplied with your **compatible adapter** for full details).

Intel® WiDi also incorporates **Intel® Wireless Music** which allows you to wirelessly stream audio from your computer to speakers connected to a **compatible wireless speaker adapter** (purchased separately).

Intel® WiDi Application Installation

1. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Option Drivers** (button).
3. Click **3.Install WiDi AP > Yes**.
4. Click **Next**.
5. Click the button to accept the license and click **Next**.
6. Click **Finish**.

Intel® Wireless Music Driver Installation

If you wish to use your system to stream wireless audio to speakers connected to a compatible wireless speaker adapter you will need to install the **Intel(R) Wireless Music Driver**.

1. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Browse** and browse to the driver location (X: denotes your DVD drive):

- **X:\Options\02WLAN\Jacksonpeak\IntelWireless MusicDriver 1.5.5323.0\auto-run.exe**

3. Click **Next**.
4. Click the button to accept the license and click **Next**.
5. Click **Finish**.
6. Follow the procedure overleaf to setup WiDi or Wireless Music.

Intel® WiDi Application Configuration

1. Click **Start > All Programs > Intel Corporation > Intel(R) Wireless Display > Intel(R) Wireless Display**, or double click the icon on the desktop.
2. Click **I agree to the terms of this license** (button).
3. The application will scan for any connected compatible adapters (or you can click the **Scan for available adapters** button to enable **Intel My WiFi Technology**).

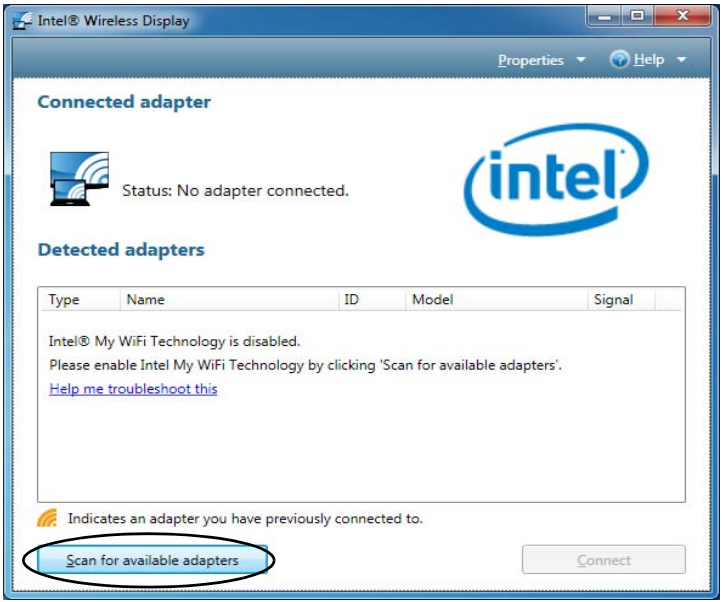


Figure 7 - 22
Intel® WiDi Scan

4. Click to select any detected adapters, and click **Connect**.
5. The system will then prompt you to enter the **4-digit security code** which will be displayed on the external TV Screen (or press the **connect** button on the wireless speaker adapter).
6. Enter the code for the video adapter and click **Continue**.

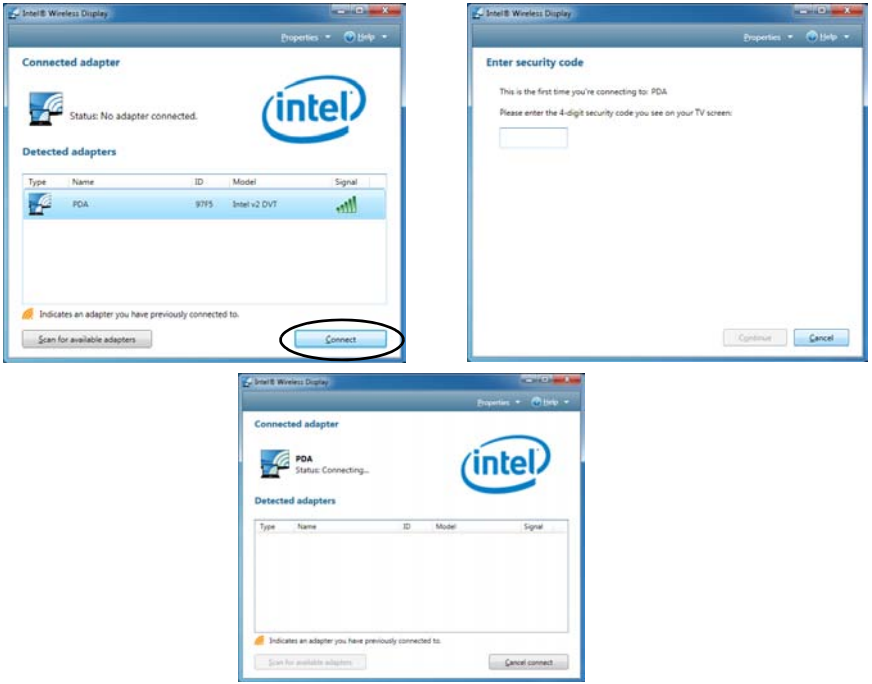


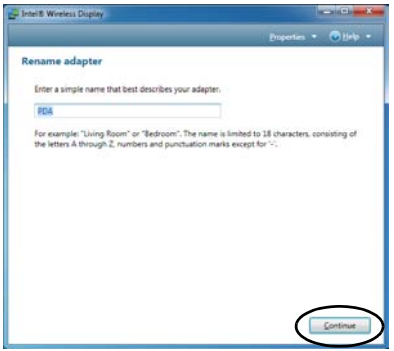
Figure 7 - 23
Intel® WiDi Connect & Enter Security Code

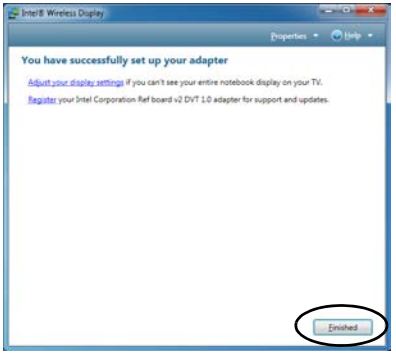
Test Audio Adapter

To verify a successful audio connection (for **Intel® Wireless Music)**, select the "**Test your audio connection**" link or select "**Finished**" to bypass the test.

You can select "**Play Sample**" to play an audio test sample from your adapter to the connected speaker set.

7. You will then be prompted to enter a name for the video adapter and click **Continue**.
8. Click **Finished** to complete the setup.





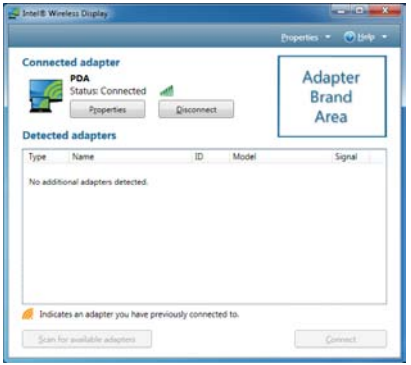


Figure 7 - 24
Intel® WiDi Connected

Bluetooth Module

If your purchase option includes the **Combination Wireless LAN & Bluetooth module** (either **Intel®** or **3rd Party**) then install the driver as instructed overleaf.

Use the **Fn + F12** key combination (see *Table 1 - 4, on page 1 - 11*) or Control Center button to toggle power to the Bluetooth module.



Bluetooth Data Transfer

Note that the transfer of data between the computer and a Bluetooth enabled device is supported **in one direction only (simultaneous data transfer is not supported)**. Therefore if you are copying a file from your computer to a Bluetooth enabled device, you will not be able to copy a file from the Bluetooth enabled device to your computer until the file transfer process from the computer has been completed.

- For **3rd party Bluetooth modules** see *"3rd Party Bluetooth (V4.0) Combo Driver Installation" on page 7 - 50* and *"Standard Bluetooth Configuration in Windows 7" on page 7 - 52*.
- For **Intel Bluetooth modules** see the installation procedure see *"Intel Bluetooth Combo Driver Installation" on page 7 - 51* and *"Standard Bluetooth Configuration in Windows 7" on page 7 - 52*.



Wireless Device Operation Aboard Aircraft

The use of any portable electronic transmission devices aboard aircraft is usually prohibited. Make sure the module(s) are OFF if you are using the computer aboard aircraft.

Use the **Fn + F12** key combination to toggle power to the Bluetooth module, and check the LED indicator to see if the module is powered on or not (see *Table 1 - 4, on page 1 - 11*/*Table 1 - 2, on page 1 - 8*).

3rd Party Bluetooth (V4.0) Combo Driver Installation

Note this driver is only required for the 3rd Party combo Bluetooth and WLAN module version 2 (Bluetooth V4.0).

1. **Before installing the driver make sure the Bluetooth module is powered on** (use **Fn + F12** key combination), then insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive. If a ***Found New Hardware*** window appears, click **Cancel** in all windows that appear, and then proceed to install the driver as below.
2. Click **Option Drivers** (button).
3. Click **5.Install Combo BT Driver > Yes**.
4. Click **Next** (if a prompt appears to ask you to turn the Bluetooth power on, press the **Fn + F12** key combination to do so, otherwise the driver will not be installed).
5. Click **Finish** to restart the computer.
6. See ***"Standard Bluetooth Configuration in Windows 7" on page 7 - 52*** for configuration instructions.

Intel Bluetooth Combo Driver Installation

Note this driver is required only for the Intel combo Bluetooth and WLAN module only.

1. **Before installing the driver make sure the Bluetooth module is powered on** (use **Fn + F12** key combination), then insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive. If a ***Found New Hardware*** window appears, click **Cancel** in all windows that appear, and then proceed to install the driver as below.
2. Click **Option Drivers** (button).
3. Click **5.Install Combo BT Driver > Yes**.
4. Click **Next > Next**.
5. Click the button to accept the license and click **Next**.
6. Click **Next > Finish**.
7. See over for configuration instructions.

Note that, at the time of going to press, **Intel® Centrino® Wireless-N 2230**, **Intel® Centrino Advanced 6235** WLAN & Bluetooth combo modules use the standard Bluetooth configuration in ***Windows 7*** (see ***"Intel Bluetooth Combo Driver Installation" on page 7 - 51***).

High Speed Bluetooth Data Transfer

The **Combination Wireless LAN & Bluetooth module** supports high speed data transfer. However to achieve such transfer speeds, **both devices must support high speed data transfer**.

To obtain high speed data transfer make sure that both the WLAN and Bluetooth modules are powered on.

Check your Bluetooth compatible device's documentation to confirm it supports high speed data transfer.

Add a Device

Click **Start**, and click **Control Panel** and then click **Devices and Printers (Hardware and Sound)**. Click **Add a device** to search for any available Bluetooth devices.

Bluetooth Module & Resuming From Sleep Mode

The Bluetooth module's default state will be off after resuming from the **Sleep** power-saving state. Use the key combination (**Fn + F12**) to power on the Bluetooth module after the computer resumes from Sleep.

Standard Bluetooth Configuration in Windows 7

For Intel and 3rd Party Driver Version 2 (Bluetooth V4.0) modules only.

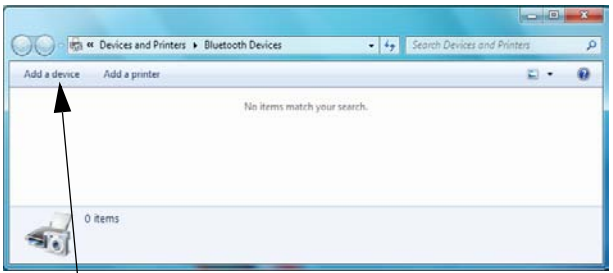
Setup your Bluetooth Device so the Computer Can Find it

1. Turn your Bluetooth device (e.g. PDA, mobile phone etc.) on.
2. Make the device discoverable (to do this check your device documentation).

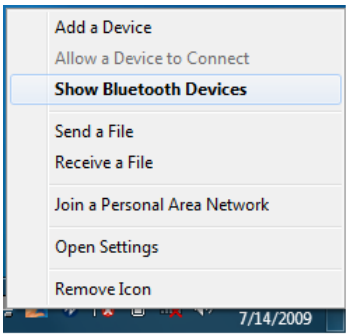
To Turn the Bluetooth Module On

1. Press the **Fn + F12** key combination to power on the Bluetooth module.
2. A Bluetooth icon will appear in the notification area.
3. You can then do any of the following to access the **Bluetooth Devices** control panel.

- **Double-click** the notification area icon to access the **Bluetooth Devices** control panel.
- **Click/Right-click** the notification area icon and choose an option from the menu.



Add a device

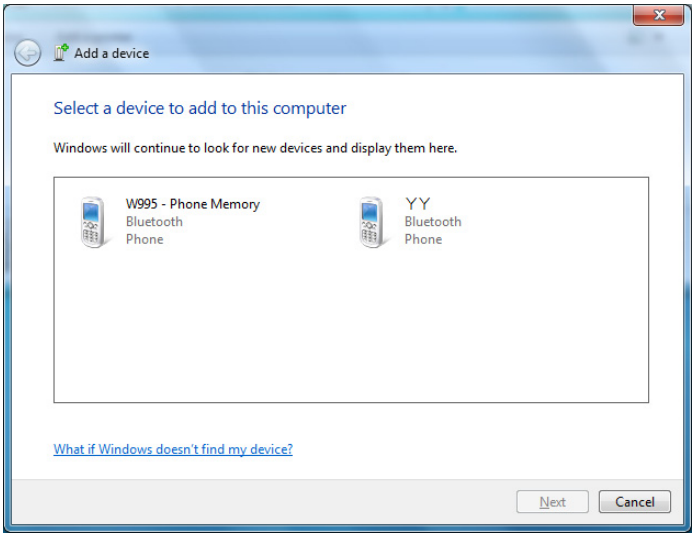


Right-Click Notification Area Icon

Figure 7 - 25
Bluetooth Devices & Click Icon Menu

To Add a Bluetooth Device

1. Access the **Bluetooth Devices** control panel and click **Add a device**.
2. Double-click the device you want to pair with the computer.



3. On first connection the computer will provide you with a pairing code to be entered onto the device.

Pairing Options

If a device has been previously connected then the pairing option menu will appear when you attempt subsequent connections. You can choose to have the computer create a pairing code for you, use the device's existing pairing code or you can pair certain devices without using a code.

Figure 7 - 26
Add a Device

4. Enter the code into your Bluetooth enabled device and follow any on-screen instructions to complete the pairing.

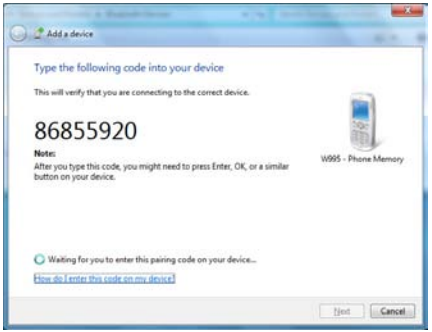


Figure 7 - 27
Pairing Code Example

Pairing Codes

The example outlined here shows a connection to a mobile device. Other devices e.g. computers, may have a slightly different connection procedure, and may require you to confirm a pairing code is correct on both devices. Follow the on-screen instructions to complete the pairing.

5. ***Windows*** will check to see if any drivers are required to complete the pairing.
6. Follow any on-screen instructions on the computer if device drivers are required to be installed.
7. Click **Close**.



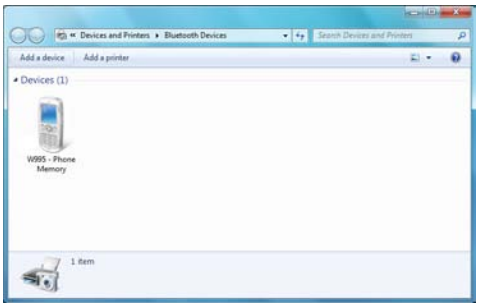


Figure 7 - 28
Pairing Complete & Bluetooth Device Enabled

To Change Settings for the Bluetooth Device

1. Click the notification area icon and select **Show Bluetooth Devices**.
2. Right-click on the device you want to change and click **Properties** to:

- Change the **name** of the device (click **Bluetooth**, type a new name and click **OK**).
- Enable/Disable a **service** (click **Services**, clear/tick the check box next to the service and click **OK**).

To Make your Computer Discoverable to Bluetooth Devices

1. Click the notification area icon and select **Open Settings**.
2. Click **Options**, and make sure that ***Allow Bluetooth devices to find this computer*** check box (**Discovery**) has a tick inside it.
3. Make sure that the ***Alert me when a new Bluetooth device wants to connect*** check box (**Connections**) has a tick inside it, if you want to be notified when a Bluetooth device wants to connect.

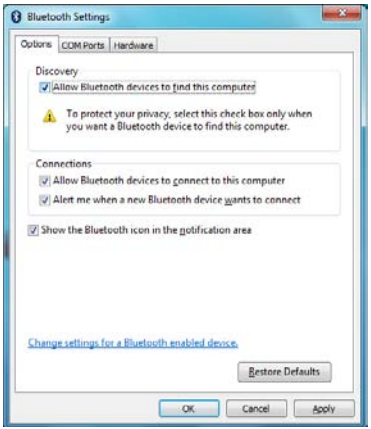


Figure 7 - 29
Bluetooth Settings - Options

Bluetooth Help

To get help on Bluetooth configuration and settings, select **Help and Support** from the **Start** menu. Type Bluetooth in the **Search Help** box, and select an item from the returned search results to get more information.



THX TruStudio & Speaker Configuration

Note that **THX TruStudio Pro will be disabled** when you are connecting to an external display through an **HDMI connection**.

THX TruStudio Pro Audio

Note that you will need to install the **THX TruStudio** audio application in order to get maximum audio performance. The **THX TruStudio AP** to allows you to configure the audio settings to your requirements for the best performance in games, music and movies.

THX TruStudio AP Installation

1. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Option Drivers** (button).
3. Click **7.Install THX TruStudio AP > Yes**.
4. Choose the language you prefer and click **Next**.
5. Click **Yes** to accept the license.
6. Click **Next**.
7. Click **Full Installation** (button).
8. Click **Next > Finish** to restart the computer.

THX TruStudio Pro Activation

On the first run of THX TruStudio Pro you will need to **activate** the application.

1. To activate the application you will need to be connected to the internet.
2. Double-click the **THX Activate** icon on the desktop and click the **Activate** button.
3. The program will connect to the internet to verify the activation key.
4. Click **Finish** to complete the application activation.
5. Restart the computer after the process is complete.

THX Audio & HDMI

Note that the THX audio effects **do not apply** to audio generated through an HDMI connection.

THX TruStudio Pro Application

The application can be run from the shortcut in the **Start** menu (**Start > All Programs > Creative > THX TruStudio Pro Settings**).



Figure 7 - 30
THX TruStudio Pro Menu

THX Control Panel

Each control has an On/Off button to allow you to enable/disable the control, and most controls feature a slider to adjust the levels (the subwoofer may be turned on/off).



Figure 7 - 31
THX TruStudio Pro Controls

- **Surround:** Provides virtual sound channels to control the level of immersion.
- **Crystalizer:** Enhances audio to make it sound livelier.
- **Speaker:** Enhances the bass level of the sound system.
- **Smart Volume:** Minimizes sudden volume changes to avoid the need for constant adjustment.
- **Dialog Plus:** Enhances dialogue levels for movies etc.

THX TruStudio Pro Headphone Settings

THX TruStudio selects the **built-in speakers** by default and this setting may cause some sound quality issues when using headphones. To **adjust the settings for headphones** do the following:

1. Run the **THX TruStudio Pro** application.
2. Select **Settings** from the menu.



Figure 7 - 32
THX TruStudio Pro Settings

3. Select **Headphones** from the drop-down menu (you can adjust the slider for crossover frequency).
4. Click **OK** and close the application.

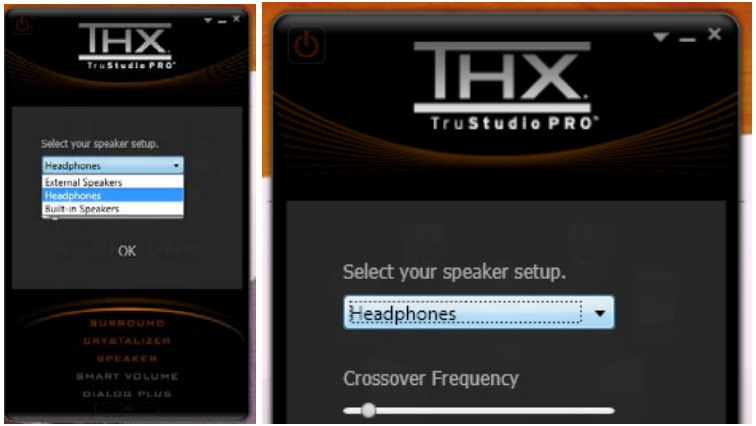


Figure 7 - 33
THX TruStudio Pro Select Headphones

THX TruStudio Pro & HDMI

1. When you connect an HDMI display to the HDMI-Out port, the THX Tru Studio Pro controls will be disabled.
2. A warning box will pop-up and will prompt ***"Do you want to select another audio device now?"***.
3. Click **No** to continue using the HDMI audio output from your external display (do not attempt to select another audio device when connected to the external HDMI display).



Figure 7 - 34
THX TruStudio Pro HDMI Display Warning

Intel® Rapid Storage Technology Driver

Install the **Intel® Rapid Storage Technology** to support your SATA drive if set up in **AHCI mode** in the BIOS (see ***"SATA Mode (Advanced Menu)" on page 5 - 9***) or if you have set up your hard disks in a RAID configuration (see***"Setting Up SATA RAID or AHCI Mode" on page 7 - 2***).

1. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Option Drivers** (button).
3. Click **8.Install IRST Driver > Yes**.
4. Click **Next > Next > Yes > Next > Next**.
5. Click **Finish** to restart the computer (you will need to restart the system again after the computer has rebooted).

If you have a **Solid State Drive (SSD)** installed in your secondary hard disk drive bay you may configure **Intel® Smart Response Technology** for your system (**see over**).

Intel® Smart Response Technology

Intel® Smart Response Technology is an **Intel® Rapid Storage Technology (RST)** caching feature that accelerates computer system performance by using the SSD as cache memory between the hard disk drive and system memory.

System Requirements to support Intel® Smart Response Technology:

- System BIOS with SATA mode set to RAID (see *"SATA Mode (Advanced Menu)" on page 5 - 9*).
- Intel Rapid Storage Technology software installed.
- A Solid State Drive (SSD) with a minimum capacity of 18.6GB (or with a partition on the drive formatted to more than 18.6GB e.g a 20GB partition set on the SSD).

See overleaf for instructions on enabling **Intel® Smart Response Technology**.

Enabling Intel Smart Response Technology

1. Run the **Intel® Rapid Storage Technology** application from the **All Programs** menu.
2. Click **Enable acceleration** either under **Status** or **Accelerate**.

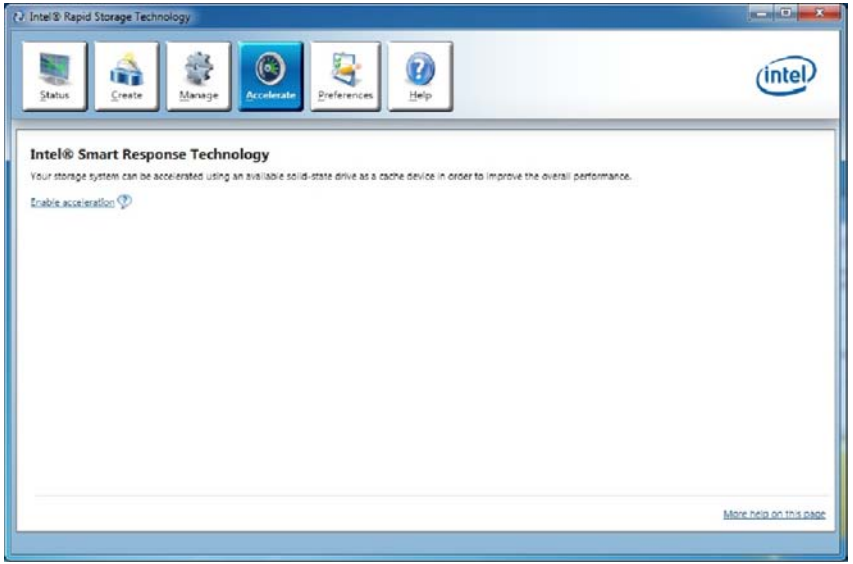


Figure 7 - 35
Enable Acceleration

3. Select the SSD to be used as a cache device.
4. Select the size from the SSD to be allocated for the cache memory (any remaining space on the SSD can be used for data storage using the simple data single-disk RAID 0 volume that is automatically created).

5. Select the HDD (or RAID volume) to be accelerated (it is highly recommended that you accelerate the system volume or system disk for maximum performance).
6. Select the acceleration mode, and then click OK (Enhanced mode is selected by default).

Note: **Enhanced mode** (default): Acceleration optimized for data protection.
Maximized mode: Acceleration optimized for input/output performance.

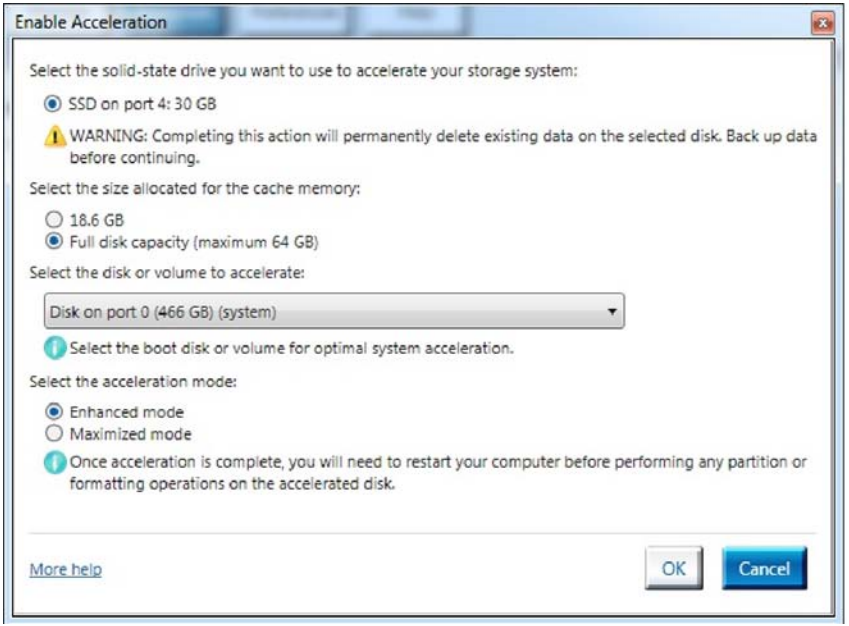


Figure 7 - 36
Enable Acceleration Options

7. The page will refresh and report the new configuration in **Acceleration**.

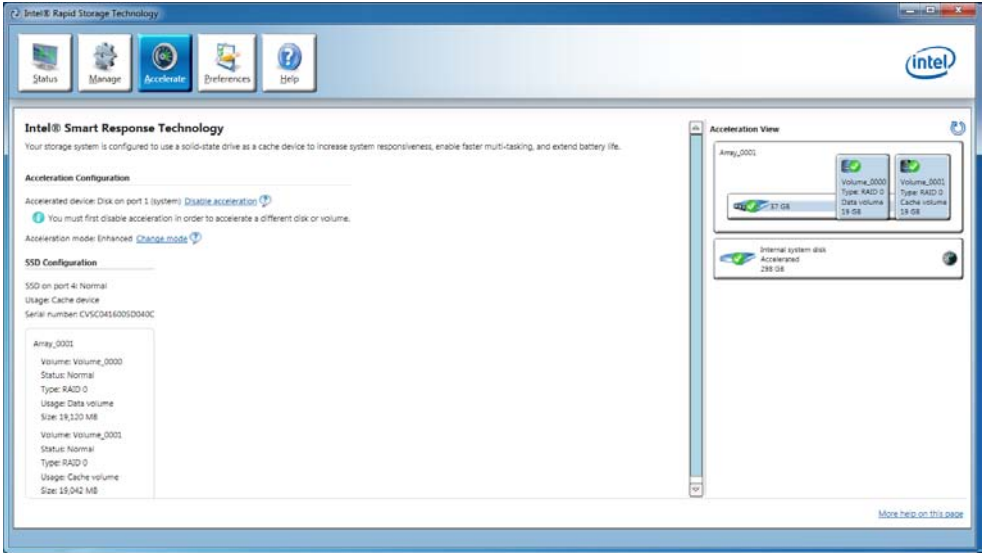


Figure 7 - 37
Intel® Rapid Storage Technology Accelerate

Intel® Rapid Start Technology Driver

Intel(R) Rapid Start Technology can resume power from Hibernation within 5 to 6 seconds and can remember your computer's previous state with zero power.

System Requirements to support Intel® Rapid Start Technology:

- Rapid Start Technology should be enabled in the BIOS (see *"Intel(R) Rapid Start Technology (Advanced Menu)" on page 5 - 9*).
- Intel Rapid Storage Technology software installed.
- A Solid State Drive (SSD) with a minimum capacity of 18.6GB (or with a partition on the drive formatted to more than 18.6GB e.g a 20GB partition set on the SSD).

See overleaf for instructions on enabling **Intel® Rapid Start Technology**.

Intel® Rapid Start Technology Configuration

1. Enable/disable **Intel(R) Rapid Start Technology** from the BIOS (see ***"Intel(R) Rapid Start Technology (Advanced Menu)" on page 5 - 9***).
2. Go the ***Windows*** control panel and double-click **Administrative Tools** (**System and Security**)**> Computer Management > Storage > Disk Management**
3. Right-click the SSD and select **Shrink Volume** from the menu.

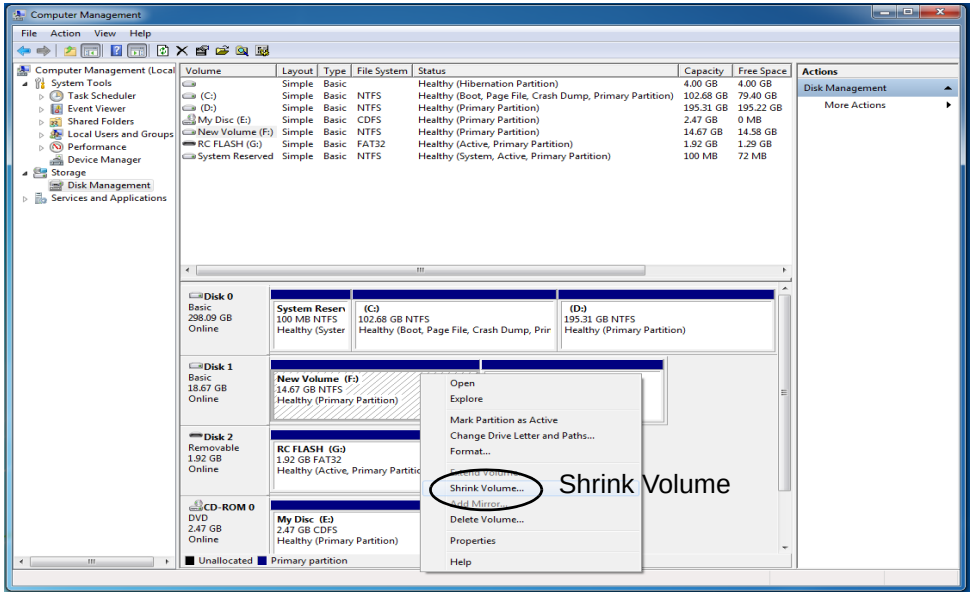
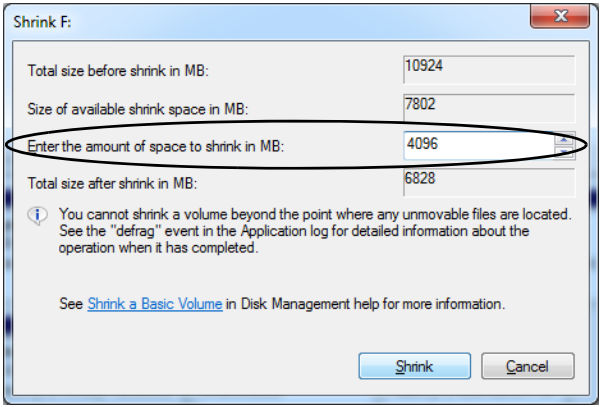


Figure 7 - 38
Computer Management (Shrink SSD Volume)

4. Enter the figure, **which should be equal to amount of system memory (RAM) in your computer,** in "**Enter the amount of space to shrink in MB**".

Figure 7 - 39
Shrink Volume Size



5. Click **Shrink** (any unallocated file space may be formatted for storage use).

Memory Size (Amount of Space to Shrink)

The figure entered in the "**Enter the amount of space to shrink in MB**" field above should be equal to the amount of system memory in your computer. In the example above the system memory is 4GB (**1024MB * 4 = 4096GB**). If you are unsure of your total system memory (RAM) then go to **System** control panel (System and Security) and check **Installed memory (RAM)**. The memory size will be displayed in GB so convert by multiplying the GB figure by 1024 to get the total in MB (e.g. 8GB = 8192MB).

6. Click the **Start** menu and type "**CMD**" in the search box.
7. Click **CMD** from the found list.

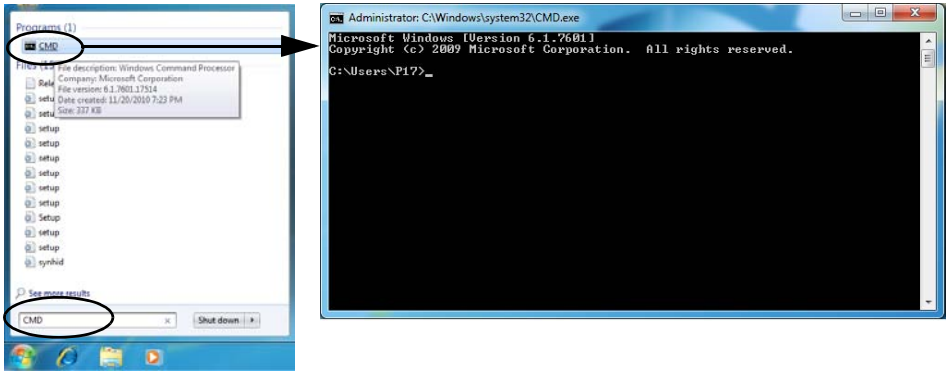


Figure 7 - 40
Search for CMD Prompt

8. Type "**DISKPART**".
9. At the DISKPART command type "**list disk**".

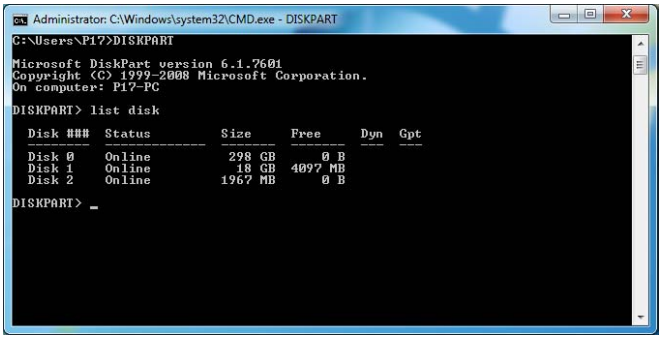


Figure 7 - 41
Diskpart - List Disk

10. Type “**select disk #**” (# is disk number where you want to create the store partition, so refer to the results obtained from "**list disk**" for exact disk number).
11. The message “**Disk # is now the selected disk.**” will appear.

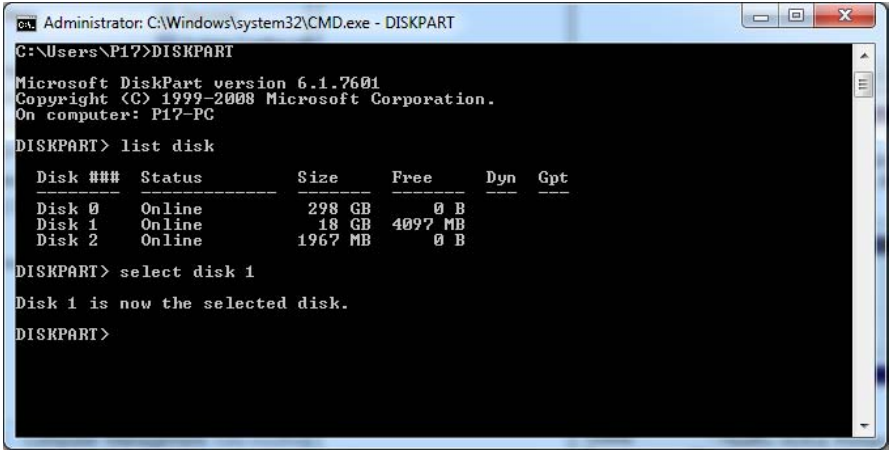


Figure 7 - 42
Diskpart - Select Disk #

12. Type “**create partition primary**”.
13. A “**DiskPart succeeded in creating the specified partition**.” message should appear.

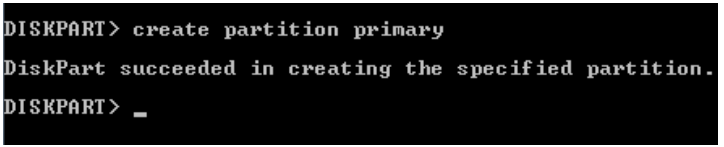


Figure 7 - 43
Diskpart - Create Partition

14. Type “**detail disk**”.

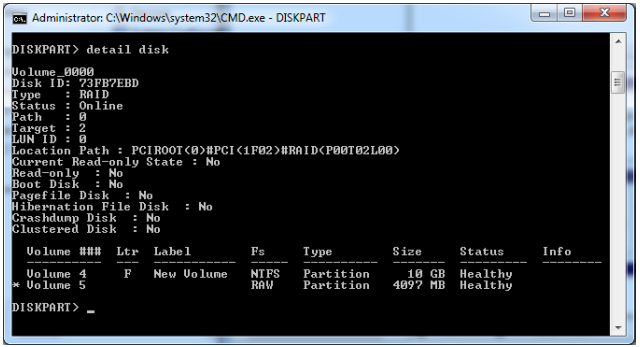


Figure 7 - 44
Diskpart - Detail Disk

15. Type “**select Volume #**” (# is volume of your storage partition so refer to results obtained from "detail disk" for the exact volume number).
16. The message “**Volume # is now the selected volume.**” will appear.

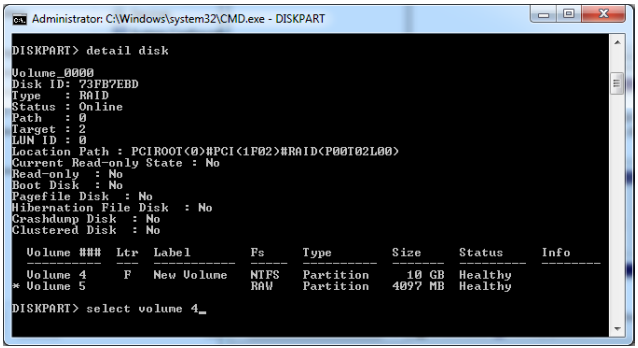


Figure 7 - 45
Diskpart - Select Volume #

17. Type "**set id=84 override**" (the id must be set to 84).

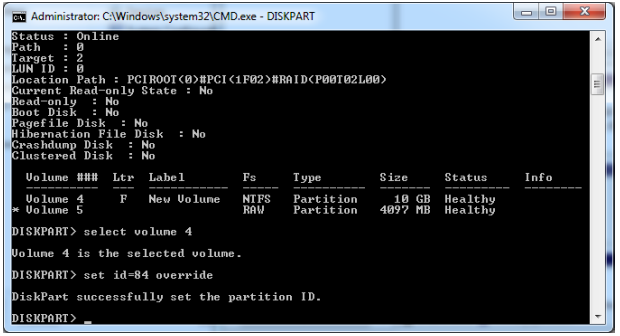


Figure 7 - 46
Diskpart - Set id=84 Override

18. The message "**DiskPart successfully set the partition ID.**" will appear.
19. Close the CMD window.
20. Go the ***Windows*** control panel and double-click **Administrative Tools** (**System and Security**)**> Computer Management > Storage > Disk Management.**
21. The disk partition should read **Healthy Hibernation Partition**.

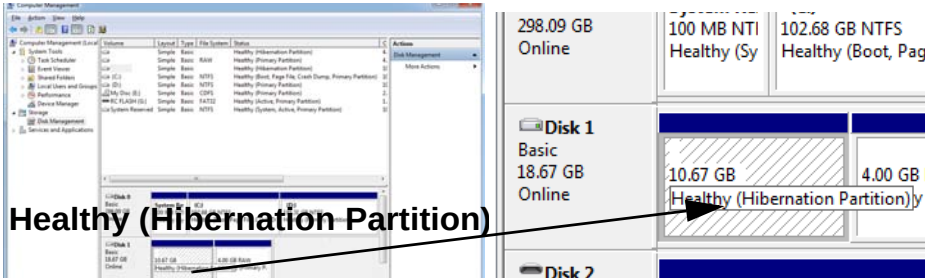


Figure 7 - 47
Computer Management (Healthy Hibernation Partition)

22. **Restart the computer**.

Intel® Rapid Start Technology Driver Installation

1. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive.
2. Click **Option Drivers** (button).
3. Click **9.Install Rapid Start Driver > Yes**.
4. Click **Next > Next > Yes > Next > Next**.
5. Click **Finish** to restart the computer.

Chapter 8: Troubleshooting

Overview

Should you have any problems with your computer, before consulting your service representative, you may want to try to solve the problem yourself. This chapter lists some common problems and their possible solutions. This can't anticipate every problem, but you should check here before you panic. If you don't find the answer in these pages, make sure you have followed the instructions carefully and observed the safety precautions in the preface. If all else fails, talk to your service representative. You should also make a record of what happened and what remedies you tried.

Of course, if something goes wrong, it will happen at the most inconvenient time possible, so you should preview this section just in case. If, after you've tried everything, and the system still won't cooperate, try turning it off for a few minutes and then rebooting. You will lose any unsaved data, but it may start working again. Then call your service representative.

Basic Hints and Tips

Many of the following may seem obvious but they are often the solution to a problem when your computer appears not to be working.

- **Power** - Is the computer actually plugged into a working electrical outlet? If plugged into a **power strip**, make sure it is actually working. Check the **LED Power Indicators** (see *"LED Indicators" on page 1 - 7*) to see the computer's power status.
- **Connections** - Check all the **cables** to make sure that there are no **loose connections** anywhere.
- **Power Savings** - Make sure that the system is not in **Hibernate** or **Sleep** mode by pressing the keys configured in your P*ower Options* (see *"Configuring the Power Buttons" on page 3 - 8*), the **Fn + F4** key combination, or power button to wake-up the system.
- **Brightness** - Check the brightness of the screen by pressing the **Fn** + **F8 and F9** keys to adjust the brightness (see *Table 1 - 4, on page 1 - 11*).
- **Display Choice** - Press **Fn** + **F7** to make sure the system is not set to "external only" display.
- **Boot Drive** - Make sure there are no **optical media and/or USB storage devices** in any connected drive when you start up your machine (this is a common cause of the message "***Invalid system disk - Replace the disk, and then press any key***" / "***Remove disks or other media. Press any key to restart***").

Backup and General Maintenance

- Always **backup** your important data, and keep copies of your OS and programs safe, but close to hand. Don't forget to note the **serial numbers** if you are storing them out of their original cases, e.g. in a CD wallet.

- Run **maintenance programs** on your hard disk and OS as often as you can. You may schedule these programs to run at times when you are not using your computer. You can use those that are provided free with your OS, or buy the more powerful dedicated programs to do so.

- Write down your passwords and keep them safe (away from your computer). This is especially important if you choose to use a **Boot** password for the SCU (see ***"Security Menu" on page 5 - 11***).

- Keep copies of vital **settings files** such as network, dialup settings, mail settings etc. (even if just brief notes).



Warranty

The CPU is not a user serviceable part. Opening this compartment, or accessing the CPU in any way, may violate your warranty.

Viruses

- Install an **Anti-Virus** program and keep the **definitions file** (the file which tells your program which viruses to look for) up to date. New computer viruses are discovered daily, and some of them may seriously harm your computer and cause you to lose data. **Anti-Virus** programs are commercially available and the **definitions file updates** are usually downloadable directly from the internet.

- Be careful when opening e-mail from sources you don't know. **Viruses** are often triggered from within **e-mail attachments** so take care when opening any attached file. You can configure most **Anti-Virus** programs to check all **e-mail attachments**. **Note**: You should also beware of files from people you know as the virus may have infected an **address book** and been automatically forwarded without the person's knowledge.

- Keep a "**Bootable CD-ROM/DVD-ROM/USB storage device**" (this CD/DVD/USB device provides basic information which allows you to startup your computer) handy. You may refer to your OS's documentation for instructions on how to make one, and many **Anti-Virus** programs will also provide such a disk (or at least instructions on how to make one).

Upgrading and Adding New Hardware/Software

- Do not be tempted to make changes to your **Windows Registry** unless you are very sure of what you are doing, otherwise you will risk severely damaging your system.

- Don't open your computer or undertake any repair or upgrade work if you are not comfortable with what you are doing.

- Read the **documentation**. We can assume, since you are reading this that you are looking at the computer's manual, but what about any new peripheral devices you have just purchased? Many problems are caused by the installation of new hardware and/or software. Always refer to the documentation of any new hardware and/or software, and pay particular attention to files entitled "**READ ME**" or "**READ ME FIRST**".

- When installing a new device always make sure the device is powered on, and in many cases you will need to restart the computer. Always check that all the cables are correctly connected.

- Make sure you have installed the **drivers** for any new hardware you have installed (latest **driver files** are usually available to download from vendor's websites).

- Thoroughly check any **recent changes** you made to your system as these changes may affect one or more system components, or software programs. If possible, go back and undo the change you just made and see if the problem still occurs.

- Don’t over complicate things. The less you have to deal with then the easier the source of the problem may be found; **Example** - if your computer has many devices plugged into its ports, and a number of programs running, then it will be difficult to determine the cause of a problem. Try disconnecting all of the devices and restarting the computer with all the peripheral devices unplugged. A process of elimination (adding and removing devices and restarting where necessary) will often find the source of a problem, although this may be time consuming.

Problems & Possible Solutions

Problem	Possible Cause - Solution
You turned the **power on** but it doesn't work.	*Battery missing / incorrectly installed.* Check the battery bay, make sure the battery is present and seated properly (the design of the battery only allows it to go in one way). Make sure there's nothing interfering with the battery contacts.
The **Battery LED power** indicator  , is blinking orange.	*Low Battery.* Plug in the AC power source. If the computer doesn't start up immediately, turn it off then on again.
You are losing **battery power** too quickly.	*The system is using too much power.* If your *OS* has a *Power Options* scheme (see ***"Power Plans" on page 3 - 4***) check its settings. You may also be using a USB device/external device that is drawing a lot of power.
Actual **battery operating time** is shorter than expected.	*The battery has not been fully discharged before being recharged.* Make sure the battery is fully discharged and recharge it completely before reusing (see ***"Battery Information" on page 3 - 11***). Check the settings of any active power plan (see ***"Power Plans" on page 3 - 4***). *A peripheral device/USB device is consuming a lot of power.* Turn off/remove the unused device to save power.
Unwelcome numbers appear when typing.	*If the LED*  *is lit, then Num Lock is turned* ***ON****.* (see ***"LED Indicators" on page 1 - 7***).

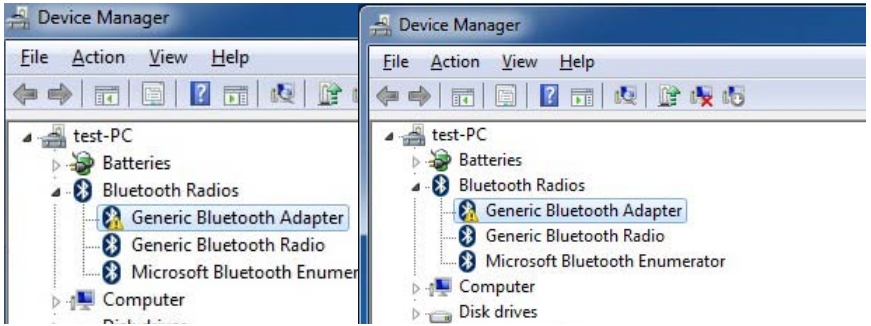
Problem	Possible Cause - Solution
The **computer feels too hot**.	Make sure the computer is properly ventilated and the vents/fan intakes are not blocked. If this doesn't cool it down, put the system into **Hibernate** mode or turn it off for an hour. Make sure the computer isn't sitting on a thermal surface (see ***"Overheating" on page 1 - 15***). Make sure you're using the correct adapter. Make sure that your notebook is completely powered off before putting it into a travel bag (or any such container). Putting a notebook which is powered on in a travel bag may cause the vents/fan intakes to be blocked.
Nothing appears on screen.	*The system is in a power saving mode*. Toggle the **Fn + F4** (see ***"Configuring the Power Buttons" on page 3 - 8***). *The screen controls need to be adjusted.* Toggle the screen control **Fn + F8/F9** key combinations. If you're connected to an external monitor, make sure it's plugged in and turned on. You should also check the monitor's own brightness and contrast controls. *The computer is set for a different display.* Toggle the screen display key **Fn + F7** combination. If an external monitor is connected, turn it on. *The **screen saver** is activated.* Press any key or touch the **TouchPad**.
No image appears on the **external monitor** I have plugged in and powered on.	*You haven't installed the video driver and configured it appropriately from the **Control Panel***. See ***"Video Driver Controls" on page C - 1*** for instructions on installing and configuring the video driver.

Problem	Possible Cause - Solution
You forget the **boot password**.	*If you forget the password, you may have to discharge the battery of the CMOS.* Contact your service representative for help.
 **Password Warning** If you choose to set a boot password, **NEVER** forget your password. The consequences of this could be serious. If you cannot remember your boot password you must contact your vendor and you may lose all of the information on your hard disk.	
The **sound** cannot be heard or the volume is very low.	*The volume might be set too low.* Check the volume control in the ***Volume Control Panel*** in the *Windows* notification area, use the key combination **Fn + F5** and **F6** to adjust the system volume (see ***"Audio Features" on page 2 - 7***) to adjust.
The **compact disc** cannot be read.	*The compact disc is dirty.* Clean it with a CD-ROM cleaner kit.
The **compact disc tray** will not open when there is a disc in the tray.	*The compact disc is not correctly placed in the tray.* Gently try to remove the disc using the eject hole (see ***"Loading Discs" on page 2 - 3***).
The **DVD regional codes** can no longer be changed.	*The code has been changed the maximum **5** times.* See ***"DVD Regional Codes" on page 2 - 5***.

Problem	Possible Cause - Solution
The **TouchPad** doesn't work.	*The Touchpad has been disabled*. Press the Touchpad toggle (**Fn + F1**) key combination (make sure you have installed the Touchpad driver.
I am sliding my finger up and down on the right side of the **TouchPad to scroll** a Window and the **TouchPad does not respond**.	*There are different TouchPad versions available on this computer, and this version requires tapping/holding to scroll.* Either tap repeatedly, or hold the finger down, at the top or bottom right of the touchpad (depending on the scrolling direction required) to scroll the window.
The **system freezes** or the screen goes dark.	*The system's power saving features have timed-out*. Use the AC/DC adapter, press a key on the keyboard, or press the sleep (**Fn + F4**) key combination, or press the power button if no LEDs are lit.
The system never goes into a **power saving mode**.	Power Options features are not enabled. Go to the ***Windows*** Power Options menu and enable the features you prefer (see ***"Power-Saving States" on page 3 - 6***). Make sure you have enabled **Hibernate** mode from the control panel.
The **Wireless LAN/ Bluetooth/PC Camera modules** cannot be **detected**.	*The modules are off.* Check the appropriate LED indicator to see if the modules are on or off (see ***Table 1 - 4, on page 1 - 11***). If the LED indicator is not illuminated, then press the appropriate function key combination in order to enable the modules.
The **Wireless LAN/ Bluetooth/PC Camera modules** cannot be **configured**.	*The driver(s) for the module(s) have not been installed*. Make sure you have installed the driver for the appropriate module (see the instructions in ***Chapter 7 "Modules"*** for the appropriate module).

Problem	Possible Cause - Solution
When a **DVD** is played in **Windows Media Player/ Media Center**, the **audio track** in other languages (commentaries etc.) **is not clear** if connected to the S/PDIF-Out Jack.	*This is an issue with Windows Media Player/Media Center and audio output through the S/PDIF-Out Jack.* We recommend that you use the **Power DVD** application to play DVDs.
Nothing appears on the screen when the **PC Camera** software is run.	*You have selected an external display as the default display device*. The PC Camera application software needs to be run while the ***default notebook LCD*** is the selected display device. After a camera picture is obtained on the default notebook LCD, you may then use the **Fn + F7** to toggle through the display modes (give the screen time to refresh). If you have selected an external display as your display device do not run the PC Camera software application until you have switched back to the notebook LCD.
A file cannot be copied to/from a connected **Bluetooth** device.	*The transfer of data between the computer and a Bluetooth enabled device is supported **in one direction only (simultaneous data transfer is not supported)***. If you are copying a file from your computer to a Bluetooth enabled device, you will not be able to copy a file from the Bluetooth enabled device to your computer until the file transfer process from the computer has been completed
The **Bluetooth** module is **off** after resuming from Sleep.	*The Bluetooth module's default state will be off after resuming from the Sleep power-saving state*. Use the key combination (**Fn + F12**) to power on the Bluetooth module after the computer resumes from Sleep.

Problem	Possible Cause - Solution
The **audio system performance is below expectation**.	*You haven't installed the **THX TruStudio** Audio application.* Install the **THX TruStudio** application which helps to get maximum audio performance. *See **"THX TruStudio Pro Audio" on page 7 - 56**.*
No sound can be heard through an **HDMI** connected display.	*You have not configured the HDMI audio output*. See ***"HDMI Audio Configuration" on page C - 22***.
Audio Volume is too low when listening through **headphones**.	*You have set the Speaker Configuration to 5.1 or 7.1 Speaker*. It is recommended that you set the **Speaker Configuration** to **Stereo** (not to 5.1 or 7.1 Speaker) when listening through headphones in order to maximize audio quality. See ***"Audio Features" on page 2 - 7***.
The **THX TruStudio Pro** audio controls don't work when the system is connected to an **external display through an HDMI cable**.	*Note that THX TruStudio Pro will be disabled when you are connecting to an external display through an HDMI connection. See **"THX TruStudio Pro & HDMI" on page B - 24**.*

Problem	Possible Cause - Solution
The **Bluetooth module is experiencing problems/ 2 Bluetooth adapters** appear in the Device Manager under **Bluetooth Radios.**	 *There is a conflict between an existing Bluetooth module and a Bluetooth & WLAN combination module*. **You should have only one Bluetooth module installed in order to prevent any conflicts (this includes the Bluetooth element of any combination WLAN & Bluetooth module)**. If you have an existing Bluetooth module installed and then decide to add a combo WLAN & Bluetooth module at a later date, then uninstall the original Bluetooth module before installing the combo module.

Problem	Possible Cause - Solution
I cannot obtain high speed Bluetooth data transfer.	*To obtain high speed Bluetooth data transfer take into account the following*: • Only the combination Wireless LAN & Bluetooth module supports high speed (data transfer. • To achieve high speed transfer speeds, **both devices must support high speed data transfer** (i.e both the computer and the Bluetooth compatible device you are connecting to). • To obtain high speed data transfer **make sure that both the computer's WLAN and Bluetooth modules are powered on** (use the **Fn + F11** to toggle power to the WLAN module and **Fn + F12** to toggle power to the Bluetooth module). • Check your Bluetooth compatible device's documentation to confirm it supports high speed data transfer, and for configuration information.

Bluetooth Connection Problems

If you are experiencing problems connecting to some Bluetooth devices (in particular certain mobile phones and headsets) it maybe necessary to download and install the **Windows Mobile Device Center** software (for ***Windows Vista*** and ***Windows 7***). Go to the Microsoft website and search for the **Microsoft Windows Device Center Driver for *Windows Vista* (*64-bit or 32-bit*) and *Windows 7* (*64-bit or 32-bit*)**, and then download the driver.

1. Install the ***Microsoft Windows Device Center Driver*** as appropriate for your operating system.
2. ***Windows Vista*** will automatically configure the driver for you, however ***Windows 7*** requires further configuration.
3. Make sure the Bluetooth device is powered on.
4. Go the ***Windows 7*** control panel and double-click **Device Manager** (**Hardware and Sound > Devices and Printers**).
5. **Bluetooth Peripheral Device(s)** will be listed under **Other Devices** (note this will only be listed if you have connected, or tried to connect to, a Bluetooth device previously).

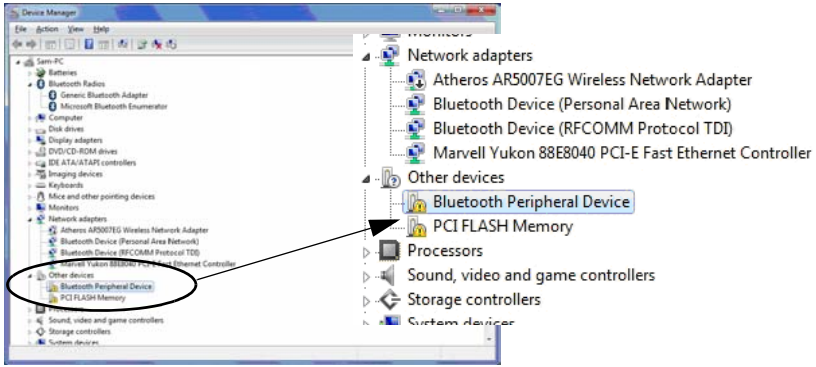


Figure 8 - 1 **- Device Manager**

Bluetooth Peripheral Devices

You will need to repeat the procedure listed here for all **Bluetooth Peripheral Devices** listed under **Other Devices** i.e. until there are no more **Bluetooth Peripheral Devices** listed under this menu heading.

6. Right-click **Bluetooth Peripheral Device** and click on ***Update Driver Software***.
7. Click **Browse my computer for driver software**.
8. Click **Let Me pick from a list of device drivers on my computer**.

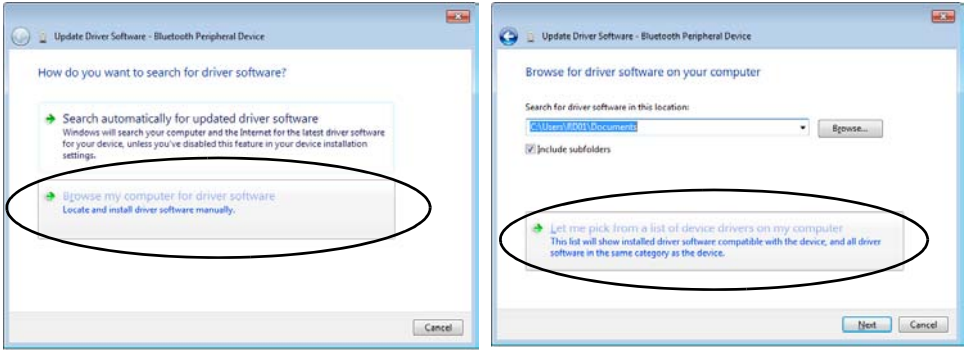


Figure 8 - 2 **- Browse my computer.../Let me pick from...**

9. Select **Bluetooth Radios** from the list.

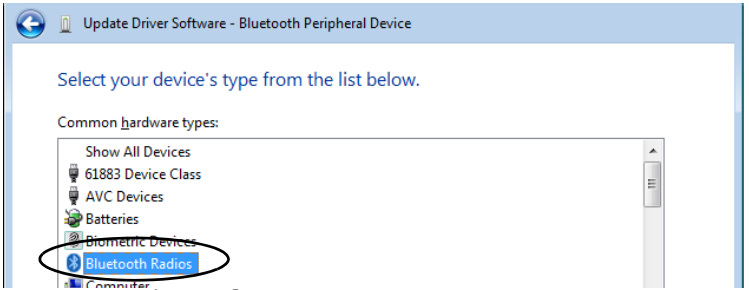


Figure 8 - 3 **- Select Bluetooth Radios**

10. A list of drivers will appear with **Manufacturer** on one side and **Model** in the other.
11. Choose **Microsoft Corporation** (make sure you choose the full name **Microsoft Corporation** and do not choose **Microsoft** - Note that you must have installed the **Microsoft Windows Device Center Driver** for **Microsoft Corporation** to appear in the list).
12. Select **Windows Mobile-based device support** from the **Model** list.

Make sure you select **Microsoft Corporation**

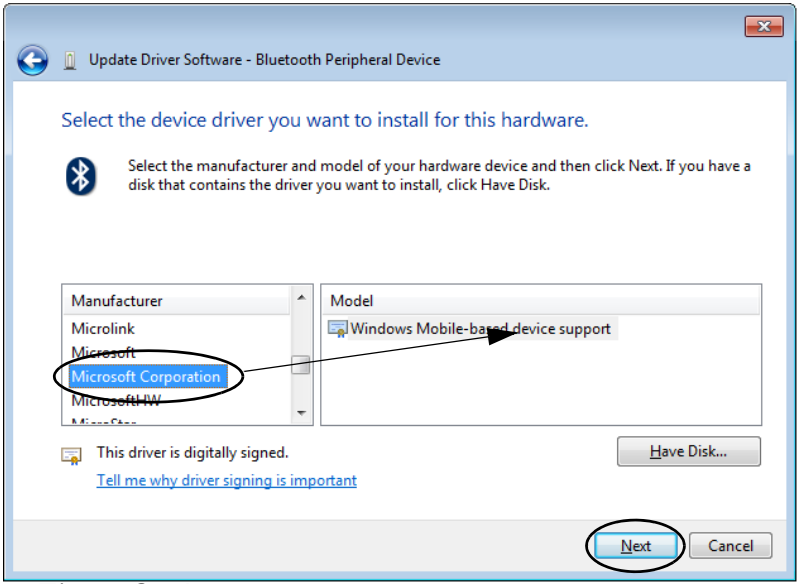


Figure 8 - 4 **- Select Device Driver**

13. Click **Next > Yes** and the driver will install.
14. Click **Close** to complete the installation.

15. The **Device Manager** should now display the **Windows Mobile-based device support** under **Bluetooth Radios**.
16. You will need to repeat the process for any other **Bluetooth Peripheral Devices** listed under **Other Devices**.

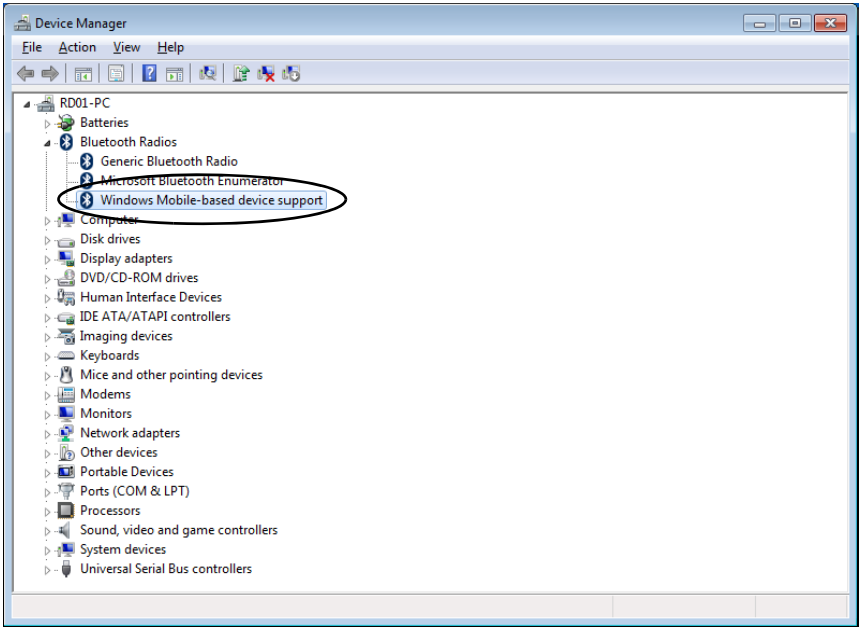


Figure 8 - 5 **- Device Manager - Bluetooth Radio**

Intel® WLAN & Bluetooth Combo Modules

Note that, at the time of going to press, **Intel® Centrino® Wireless-N 2230** and **Intel® Centrino Advanced 6235** WLAN & Bluetooth combo modules use the standard Bluetooth configuration in ***Windows 7*** (see ***"Intel Bluetooth Combo Driver Installation" on page 7 - 51***).

Installing Windows 7 (pre Service Pack 1) for RAID Systems with Advanced Format Disks

The following information is only applicable under the following conditions:

- You are configuring your SATA hard disks in a **RAID**.
- You are using **Advanced Format hard disks** that have a **4KB physical sector size**.
- You are using a ***Windows 7*** version that **DOES NOT include Service Pack 1** on the DVD disc.

Windows 7 versions **pre Service Pack 1** (i.e. those that do not include the installation of Service Pack 1 from the actual DVD disc) require a driver to support Advanced Format hard disks with a 4KB physical sector size when used in a RAID.

This driver is included on the ***Device Drivers & Utilities + User's Manual disc*** but you will need to go to an operable computer and copy the driver to a USB Flash drive, external USB hard disk or external floppy disk drive and floppy diskette, as it is required as part of the ***Windows 7*** system installation process.

1. Go to the operable computer and insert a USB Flash drive, external USB hard disk or external USB floppy disk drive and floppy diskette.
2. Insert the ***Device Drivers & Utilities + User's Manual*** disc into the CD/DVD drive of the operable computer.
3. Copy the **f6flpy-xx** folder from the location below (D: denotes your DVD drive) on the ***Device Drivers & Utilities + User's Manual*** disc to the USB Flash drive, external USB hard disk or floppy diskette.

- **For Windows 7 32bit = D:\Option\00RAID\f6flpy-x86**
- **For Windows 7 64bit = D:\Option\00RAID\f6flpy-x64**

4. Press a key at system startup to begin installing ***Windows*** from your ***Microsoft Windows 7*** disc (make sure the DVD device is set at the top of the **Boot Sequence** in the BIOS - see ***"Boot Option Priorities (Boot Menu)" on page 5 - 14***).
5. Click **Install Now**.
6. Make sure your USB Flash drive, external USB hard disk or external USB floppy disk drive and floppy diskette is attached to one of the USB ports on the computer.
7. Click "**I accept the license terms**" tickbox and click **Next**.
8. Click **Custom (advanced)**.
9. Click to select **Load Driver** when the "**Where do you want to install Windows?**" screen appears.
10. Click **Browse** and browse to the location you copied the files to on your USB Flash drive, external USB hard disk or external USB floppy disk drive and floppy diskette (X: denotes your USB Flash drive, external USB hard disk or external USB floppy disk drive):

- **Windows 7 32bit - X:\f6flpy-x86\iaStor.inf**
- **Windows 7 64bit - X:\f6flpy-x64\iaStor.inf**

11. Click **Next** (or format the drive to your preferences).
12. Follow the on-screen instructions to install the ***Windows 7*** operating system.
13. Install the ***Windows*** drivers from the ***Device Drivers & Utilities + User's Manual*** disc as per ***Table 4 - 1, on page 4 - 3*** (make sure you install the Intel Rapid Storage Technology driver - see ***"Intel® Rapid Storage Technology Driver" on page 7 - 61***).

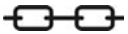
Appendix A: Interface (Ports & Jacks)

Overview

The following chapter will give a quick description of the ports & jacks which allow your computer to communicate with external devices, connect to the internet etc.

Ports and Jacks

Item	Description
Card Reader 	The card reader allows you to use the following digital storage cards: MMC (MultiMedia Card) / RSMMC SD (Secure Digital) / Mini SD / SDHC / SDXC MS (Memory Stick) / MS Pro / MS Duo Push the card into the slot and it will appear as a removable device.
DC-In Jack 	Plug the supplied AC/DC adapter into this jack to power your computer.
DVI-Out Port 	The DVI-Out (**Digital Visual Interface**) Port is a video connector interface. This allows you to connect an external monitor, TV or Flat Panel Display etc. as a display device (see ***"Display Devices & Options" on page C - 7***) by means of a DVI cable. If you are using an older type of monitor you will need to use a converter to convert the signal from DVI to VGA.
e-SATA / USB 3.0 Combo Port  /e-SATA	This **e-SATA** (**external Serial Advanced Technology Attachment**) port allows you to plug-in external Serial ATA hard drives. This port also serves as a USB 3.0 port.

Item	Description
HDMI-Out Port 	The HDMI-Out (**High-Definition Multimedia Interface**) port is an audio/video connector interface for transmitting uncompressed digital streams. This allows you to connect an external monitor, TV or Flat Panel Display etc. as a display device (see ***"Attaching Other Displays" on page C - 8***) by means of a HDMI cable. **Note that HDMI carries both audio and video signals** (see ***"HDMI Audio Configuration" on page C - 22***).
Headphone-Out Jack 	**Headphones** or **speakers** may be connected through this jack. **Note**: Set your system's volume to a reduced level before connecting to this jack.
Microphone-In Jack 	Plug an external microphone in to this jack to record on your computer.
RJ-45 LAN Jack 	This port supports LAN (Network) functions. **Note**: Broadband (e.g. ADSL) modems usually connect to the LAN port.
S/PDIF-Out Jack 	This S/PDIF (**Sony/Philips Digital Interface Format**) Out Port allows you to connect your DVD-capable PC to a Dolby AC-3 compatible receiver for "5.1" or 'dts' surround sound.
Security Lock Slot 	To prevent possible theft, a Kensington-type lock can be attached to this slot. Locks can be purchased at any computer store.

Interface (Ports & Jacks)

Item	Description
USB 2.0/1.1 Ports  USB 3.0 Port 	These USB (**Universal Serial Bus**) 2.0 compatible ports (USB 2.0 is fully USB 1.1 compliant) are for low-speed peripherals such as keyboards, mice or scanners, and for high-speed peripherals such as external HDDs, digital video cameras or high-speed scanners etc. Devices can be plugged into the computer, and unplugged from the computer, without the need to turn the system off (if the power rating of your USB device is 500mA or above, make sure you use the power supply which comes with the device). The USB 3.0 ports are denoted by their blue color; USB 2.0 ports are colored black. USB 3.0 will transfer data much faster than USB 2.0, and is backwards-compatible with USB 2.0. Note that USB 3.0 ports require a driver installation (see ***"USB 3.0" on page 4 - 7***), does not support wake on USB and is not operational under DOS.

Appendix B: Control Center

Overview

The following chapter will give a quick description of the functions of the **Control Center**. The **Control Center** gives quick access to frequently used controls, power management features and enables you to quickly turn modules on/off. Click the **Control Center** icons to toggle the appropriate function, or hold the mouse button down and move the slider where applicable. Certain functions will automatically be adjusted when a power mode is selected.



Figure B - 1 **- Control Center**

Power Modes

You can set a **Power Mode** by clicking the appropriate icon at the top of the **Control Center**. Each power mode will affect the power status of modules (e.g. WLAN, Bluetooth, 3G or Camera), screen brightness, TouchPad power and Silent Mode.

You can click a **Control Center** icon to set an overall power mode and then click individual icons in the **Control Center** to power on/off any modules etc.

The **table overleaf** illustrates the basic settings for each power mode. If you choose user defined the settings will correspond to your selected system settings.

Modes		Power Saving	Flight	Entertainment	Quiet	Performance	User Defined
Icon							
Power Plan		Power Saver	Balanced	Power Saving	Power Saving	High Performance	User Defined
Power Conservation Mode		Energy Star	BIOS Default	Energy Star	Energy Star	Performance	
Brightness		14	42	100	42	100	
WLAN		OFF	OFF	ON	ON	ON	
Bluetooth		BIOS Default					
PC Camera		OFF	OFF	OFF	ON	ON	
3G		OFF	OFF	OFF	OFF	OFF	
TouchPad		ON	ON	OFF	ON	ON	

Table B - 1- **Power Modes**

Power Status

The **Power Status** icon will show whether you are currently powered by the battery, or by the AC/DC adapter plugged in to a working power outlet. The power status bar will show the current battery charge state.

Brightness

The **Brightness** icon will show the current screen brightness level. You can use the slider to adjust the screen brightness or the **Fn + F8/F9** key combinations, or use the **Fn+ F2** key combination to turn off the LED backlight (press any key to turn it on again). Note that screen brightness is also effected by the **Power Mode** selected (see *Table B - 1, on page B - 3*).

Volume

The **Volume** icon will show the current volume level. You can use the slider to adjust the Volume or the **Fn + F5/F6** key combinations, or use the **Fn+ F3** key combination to mute the volume.

Power Conservation

This system supports **Energy Star** power management features that place computers (CPU, hard drive, etc.) into a low-power sleep modes after a designated period of inactivity (see *"Power Conservation Modes" on page 3 - 10*). Click either the **Performance**, **Balanced** or **Energy Star** button. Click in a blank area of the icon or press a key on the keyboard to exit **Power Conservation Mode** without making any changes.



Sleep

Click the **Sleep** button to bring up the **Hibernate** or **Sleep** buttons, and click either button to have the computer enter the appropriate power-saving mode (see *"Power-Saving States" on page 3 - 6*). Click in a blank area of the icon or press a key on the keyboard to exit **Power Conservation Mode** without making any changes

Display Switch

Click the **Display Switch** button to access the menu (or use the + **P** key combination) and select the appropriate attached display mode (see page *C - 13*).

Time Zone

Clicking the **Time Zone** button will access the **Date and Time** ***Windows*** control panel.

Desktop Background

Clicking the **Desktop Background** button will allow you to change the desktop background picture.

TouchPad/PC Camera/Wireless LAN Module /Bluetooth/3.75G Module

Click any of these buttons to toggle the TouchPad or module's power status. A crossed out icon will appear over the top left of the icon when it is off. Note that the power status of a module, and TouchPad power, is also effected by the **Power Mode** selected (see *Table B - 1, on page B - 3*). The 3.75G Module is an option for **Model A** only.

Caps Lock/Scroll Lock/ Number Lock

Click the button to toggle the appropriate lock mode.

Appendix C: Video Driver Controls

The basic settings for configuring the LCD are outlined in ***"Video Features" on page 1 - 17***.

Video Driver Installation

Make sure you install the drivers in the order indicated in ***Table 4 - 1, on page 4 - 3***. Insert the *Device Drivers & Utilities + User's Manual* disc and click ***Install Drivers*** (button).

Video (VGA)

1. Click **2.Install VGA Driver > Yes**.
2. Click **Next > Yes > Next > Next**.
3. Click **Finish** to restart the computer.

NVIDIA Video (VGA)

1. Click **3.Install nVIDIA VGA Driver > Yes**.
2. Click **AGREE AND CONTINUE (**button) to accept the terms of the license agreement.
3. Click **Next**.
4. Click the **RESTART NOW** button to restart the computer.

Video Card Options

Note that card types, specifications and drivers are subject to continual updates and changes. Check with your service center for the latest details on video cards supported (**see *"Video Adapter Options" on page D - 4*, or contact your service center for details**).

C

iGPU or dGPU

Note the NVIDIA control panel refers to **High-performance NVIDIA processor** (which is the discrete GPU) and **Integrated graphics** (which is the integrated GPU).

NVIDIA® Optimus™ Technology

Most notebook computers come with either a **discrete** or **integrated** graphics solution.

Discrete graphics solutions feature a dedicated Graphics Processing Unit (GPU) which are capable of playing games, watching HD video or running GPU-based applications. However computers with discrete graphics solutions tend to be heavy in power consumption, and slightly larger in size in order to incorporate the dedicated discrete GPU.

Integrated graphics solutions usually feature memory sharing technology to help save power consumption and allow for longer battery life. However computers with integrated graphics solutions will not usually run games, HD video or GPU-based applications without severe limitations.

Nvidia® Optimus™ technology is a seamless technology designed to get best performance from the graphics system while allowing longer battery life, without having to manually change settings. Thus when an application is run that requires extra performance or quality, then the system will run the discrete GPU (dGPU); when the system does not require such enhanced performance it will let the integrated (iGPU) handle it.

How Optimus Technology works

When the system is powered up and is displaying just the desktop, the dGPU will be powered off. In this case the system is running in the same way as a system without a discrete graphics solution. However when an application that requires use of the dGPU is run (e.g, a game or HD Video), the dGPu is powered on and takes over the processing duties. If the program is closed, then the dGPU will be powered back down again until required.



UMA Mode & Performance

UMA Mode is designed for **maximum power saving**, however this does have an affect on the system's overall video performance (as it is based on the Power saver power plan).

If you require better video performance then it is recommended that you use **Optimus Mode**. Alternatively you may switch the **UMA Mode** power plan to Balanced (however power savings will be reduced in this case).

Note that when the power plan is set to UMA Mode the GPU LED indicators may no longer display the correct status.



Customization Options

Although **Optimus** is completely seemless to the user, NVIDIA also allow customization options within the control panel (see ***"Optimus™ Customization Options" on page C - 16***).

GPU Button

This computer also features a button that allows the user to switch between **Optimus Mode** and **UMA Mode** (Unified Memory Architecture). **UMA Mode** will use only the integrated GPU; **Optimus Mode** will allow the system to automatically determine whether the **dGPU** or **iGPU** is used. Thus the user can completely control how the graphics system operates. Press the GPU button, and the button color will indicate the current mode.

Table C - 1
GPU Button Modes

Icon	Color	Description	Power Plan
	Green	**UMA Mode** Activated - The system will use the integrated GPU (iGPU) only	UMA Mode
	Orange	**Optimus Mode** Activated - Optimus technology will determine when to use the integrated GPU (iGPU) or discrete (dGPU) automatically	Balanced

The **GPU LED indicators** will display which GPU is currently in use.

Table C - 2
GPU LED Indicators

Icon	Color	Description
	Green	Integrated GPU (**iGPU**) Activated
	Orange	Discrete GPU (**dGPU**) Activated

Intel® Graphics & Media Control Panel

Advanced video configuration options are provided by the **Intel® Graphics and Media Control Panel**. To access the control panel:

1. Click **Advanced settings** in the **Screen Resolution** control panel in ***Windows***.
2. Click the **Intel(R)...** tab and click **Graphics Properties** (button).

OR

3. Right-click the desktop and select **Graphics Properties** from the menu.

OR

4. Double-click the **Intel(R) G&M** control panel in ***Windows***.
5. Choose the application mode (**Basic, Advanced or Wizard**) required (see sidebar).

Application Mode

Note that all figures pictured, and instructions outlined here are based on the **Advanced Application Mode**.

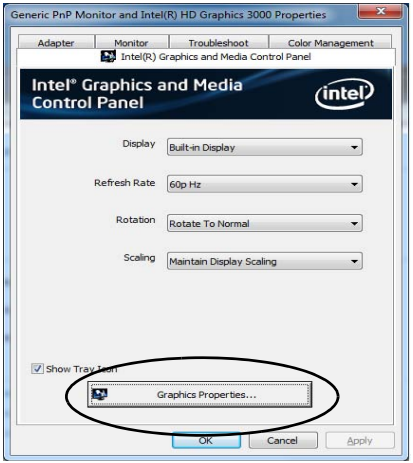




Figure C - 1
Intel® G&M Control Panel

C

Options & Support

Click **Options & Support** and select an item from the sub-menu to bring up the help and support topics.

You will need to be connected to the Internet to access the key resource links.

Multiple Display

At least one other display must be attached in order to view multiple display selection options.

You may make changes to any of the graphics properties by clicking the appropriate menu tab on the left of the menu and adjusting the settings on the right.



Figure C - 2
Intel® G&M Control Panel Tabs

Display Devices & Options

Note that you can use an external display connected to the HDMI-Out port or external monitor port. See your display device manual to see which formats are supported.

Attaching Displays

When you first attach an external display you may find that the desktop does not occupy the full screen area. Use either the display's auto adjust/configure controls, or the Intel(R) G&M control panel to configure the full screen display.

Intel Display Mode	Description
Single Display	One of the connected displays is used as the display device
Clone Displays	Both connected displays output the same view and may be configured independently
Extended Desktop	Both connected displays are treated as separate devices, and act as a virtual desktop

Function Key Combination

You can use the **Fn + F7** key combination to toggle through the display options:

- Notebook Only
- External Display Only
- Notebook + External Display

Make sure you give the displays enough time to refresh.

Note that HDMI supports video and audio signals.

Table C - 3
Display Modes

C

Multiple Display

At least one other display must be attached in order to view **Multiple Display** selection options.

General Settings

Click **General Settings** to access settings the options for any attached display.

Attaching Other Displays

If you prefer to use a monitor or flat panel display, connect it to the external monitor port or HDMI-Out port.

To Clone Displays:

1. Attach your display to the external monitor port or HDMI-Out port, and turn it on.
2. Go to the **Intel(R) G&M** control panel and click **Display > Multiple Displays**.
3. Click **Operating Mode** and select **Clone Displays** from the menu.
4. Click **Apply**, and **OK** to confirm the settings change.
5. You can switch the **Primary/Secondary Display** from the menu.

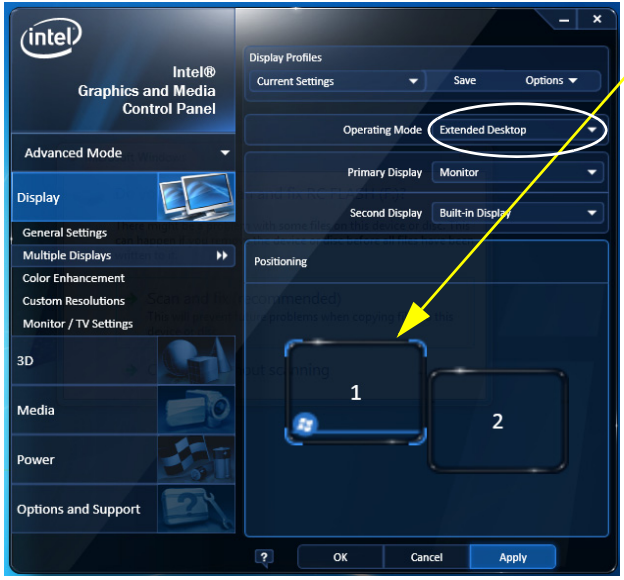


Figure C - 3
Display > Multiple Displays (Clone)

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To Enable Extended Desktop:

1. Attach your display to the external monitor port or HDMI-Out port, and turn it on.
2. Go to the **Intel(R) G&M** control panel and click **Display > Multiple Displays**.
3. Click **Operating Mode** and select **Extended Desktop** from the menu.
4. Click **Apply**, and **OK** to confirm the settings change.



Click the appropriate monitor icon and drag it to match the physical arrangement you wish to use (e.g. the secondary display may be extended left/right/above/below the primary display).

Click General Settings to make any adjustments required.

Display Settings Extended Desktop

You can have different Colors, Screen Area and Monitor Refresh Rates for each display device **provided your monitor can support them**.

You can drag the monitor icons to match the physical layout of your displays. Icons and programs may also be dragged between the displays.

Figure C - 4
Display > Multiple Displays (Extended)

C

Display Profiles

You can save display settings to be loaded at any time.

1. Go to the **Intel(R) G&M** control panel and click **Display**.
2. Configure the General Settings, Multiple Displays, Color Enhancement, Custom Resolution & Monitor/TV Settings to your preferences.
3. Click **Apply**, and **OK** to confirm the settings change.
4. Click the **Save** button at the top of the General Settings, Multiple Displays or Color Enhancement menus (under **Display Profiles**).
5. Type a name for the **Profile** and click **OK**.
6. The **Profile** will be listed under **Display Profiles**.
7. Select the profile from the pull-down menu and click **Apply**, and **OK** to confirm the settings change.

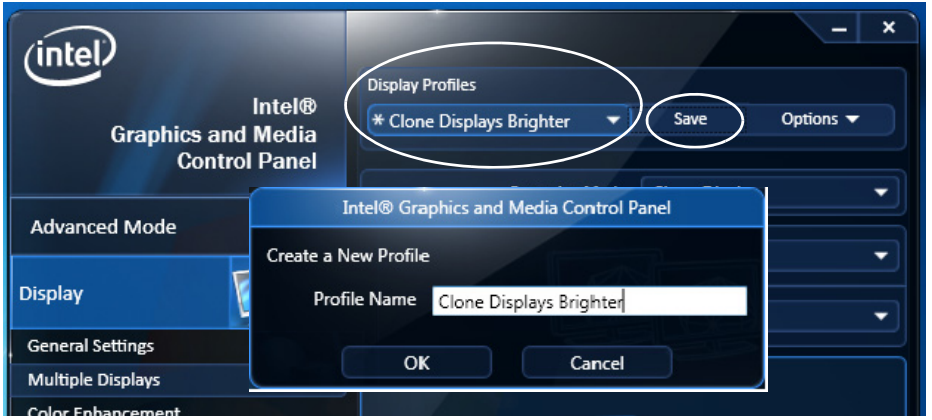


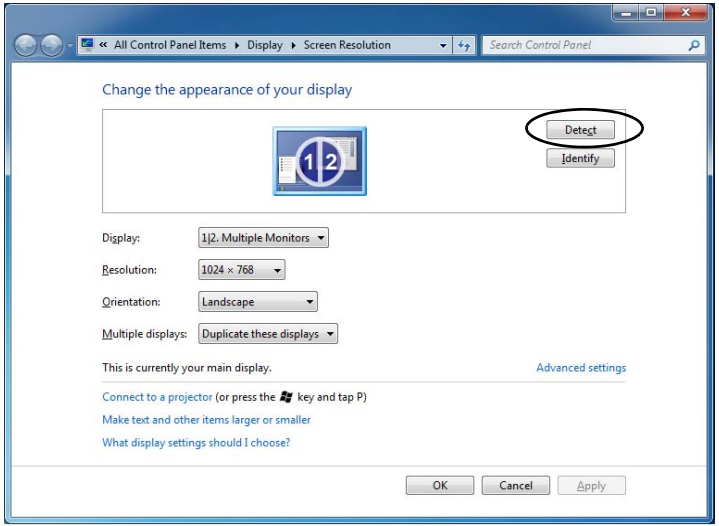
Figure C - 5
Intel® G&M Profiles

C

Configuring an External Display in Windows 7

You can also use the **Screen Resolution** control panel in ***Windows 7*** to configure an external display.

1. Attach your display to the external monitor port or HDMI-Out port, and turn it on.
2. Go to the **Screen resolution** control panel (see page *1 - 18*).
3. Click the **Detect** button.
4. The computer will then detect any attached displays.



Function Key Combination

You can use the **Fn + F7** key combination to toggle through the display options:

- Notebook Only
- External Display Only
- Notebook + External Display

Make sure you give the displays enough time to refresh.

Note that HDMI supports video and audio signals.

Figure C - 6
Screen Resolution Multiple Displays (Win 7)

C

5. You can configure the displays from the **Multiple Displays** menu.

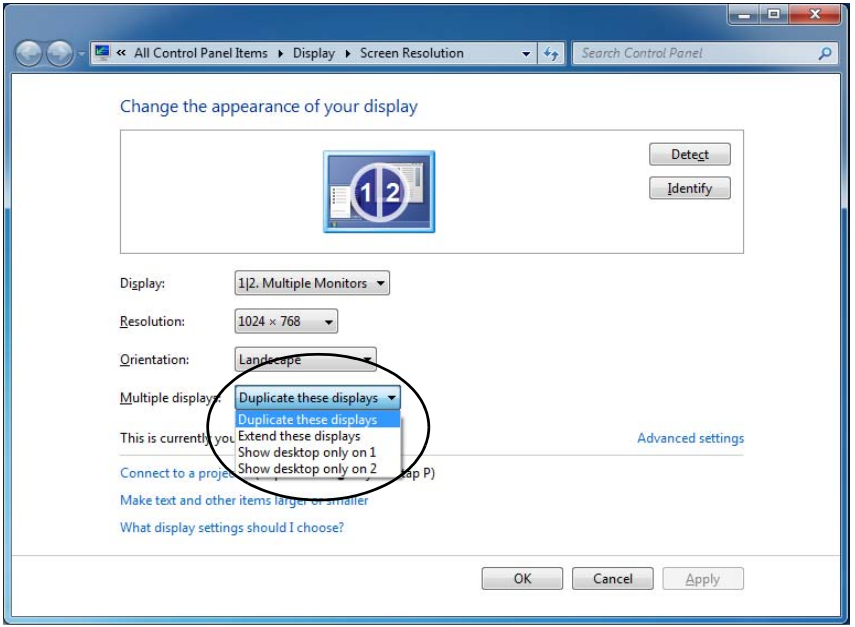


Figure C - 7
Screen Resolution Multiple Display Options (Win 7)

- Duplicate these displays - Shows an exact copy of the main display desktop on the other display(s)
- Extend these displays - Treats both connected displays as **separate** devices
- Show desktop only on 1/2 - Only one of your displays is used.

Using the Windows Logo Key + P Key Combination to Switch Displays

You can also use the + **P** key combination to quickly change display configuration and modes (this is particularly useful when attaching a projector) in ***Windows 7***.

1. Attach your display to the external monitor port or HDMI-Out port, and turn it on.
2. Press the + **P** key combination.
3. An on-screen menu will pop up.
4. Use the cursor keys (or + **P**) to select the appropriate configuration from the menu, and press Enter to confirm the selection.

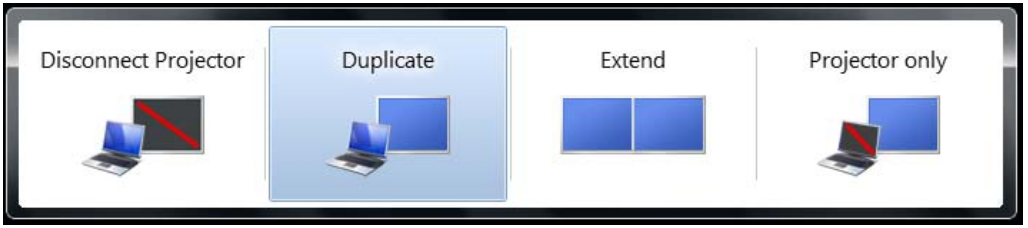


Figure C - 8
+ P Display Configuration Selection (Win 7)

NVIDIA Control Panel

To access the **GeForce.....** control panel from the desktop; right-click the **desktop**, then click **NVIDIA Control Panel**.

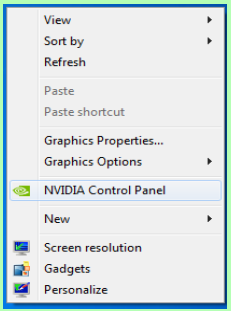


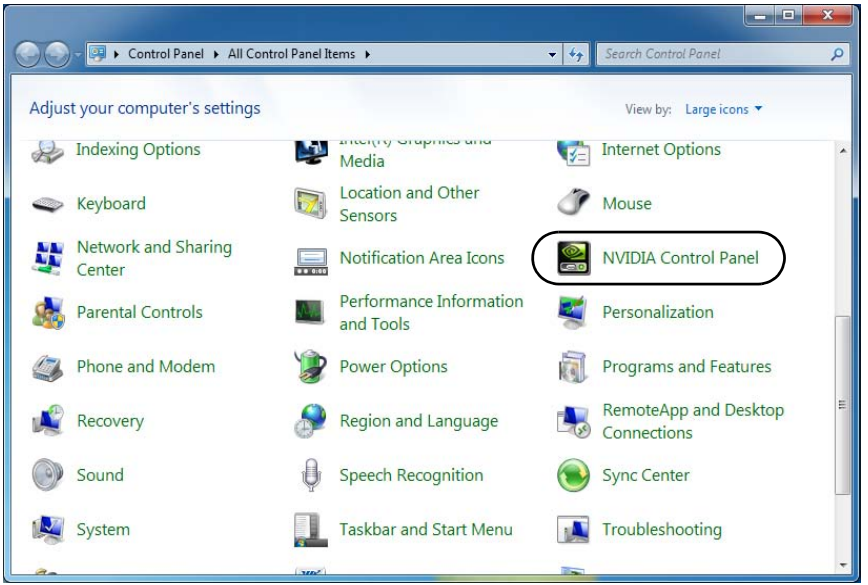
Figure C - 9

NVIDIA GeForce..... Control Panel

NVIDIA Control Panel

More advanced video configuration options are provided in the **NVIDIA Control Panel** tab.

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**).
2. Double-click **NVIDIA Control Panel** (click "**Classic View"** from the left of the menu if you are in **Control Panel Home**).



The **NVIDIA Control Panel** provides additional video configuration controls and tools which allow quick access to features such as image settings, 3D Settings and video configuration.

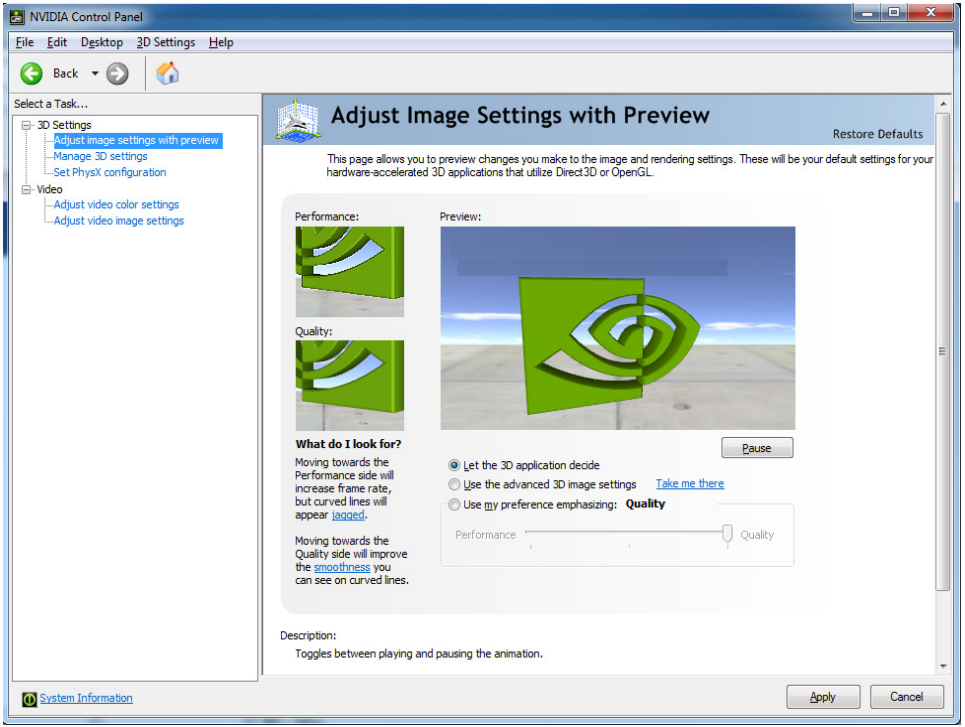


Figure C - 10
NVIDIA Control Panel

Navigating the Control Panel

Navigate through the control panels in much the same way as you would a web page. Click on the sub-heading tasks in the left menu (and on the highlighted links) for information. Use the buttons on the top left to go back, forward etc.

Display GPU Activity Icon

Click to enable **Display GPU Activity Icon in the Notification Area** to quickly access the GPU Activity monitor from the taskbar.

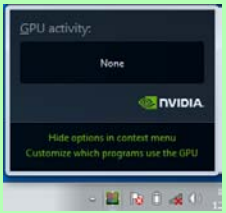


Figure C - 11
NVIDIA Control Panel - View

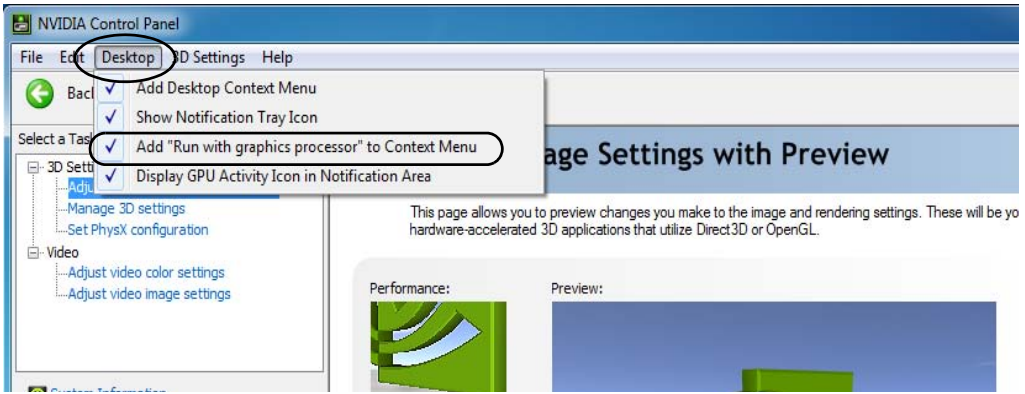
Optimus™ Customization Options

One of the most important aspects of **Nvidia® Optimus™** technology is that it will switch between the integrated GPU and discrete GPU seamlessly and automatically, and does not require any input from the user. However customization options are offered for users who prefer to set their own parameters for GPU usage.

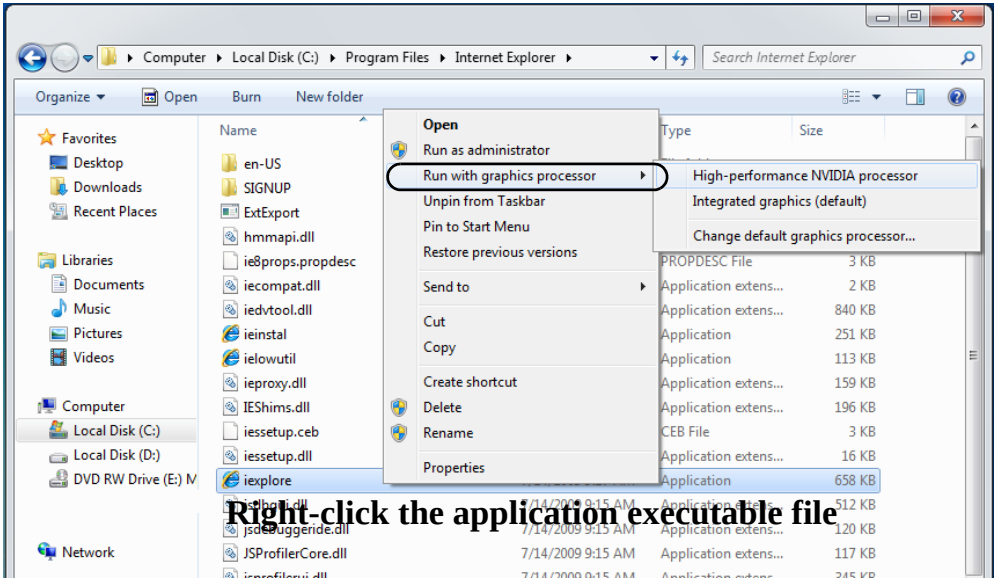
Context Menu

One of the quickest ways to choose which GPU to use for a particular application is by using the "**Run with graphics processor**" in the context menu.

1. Go to the **NVIDIA Control Panel** (see page *C - 14*).
2. Click **Desktop** from the top menu and select **Add "Run with graphics processor" to Context Menu** (it should have a tick alongside it).



3. Close the **NVIDIA Control Panel**.
4. Find the executable file icon of the application you want to run.
5. Right-click the icon and select **Run with graphics processor** from the context menu.
6. Select either **High-performance NVIDIA processor** (dGPU) or **Integrated graphics (iGPU)** to run the program with the selected GPU.



Right-click the application executable file

iGPU or dGPU

Note the NVIDIA control panel refers to **High-performance NVIDIA processor** (which is the discrete GPU) and **Integrated graphics** (which is the integrated GPU).

Figure C - 12

Context Menu with Run with graphics processor

C

Global Settings

Global settings allows you to set the preferred graphics processor for overall use. Ideally this would be the iGPU for battery life, but this can be set to the dGPU if preferred.

1. Run the **NVIDIA Control Panel** (see page *C - 14*).
2. Click **Manage 3D Settings (3D Settings)** and select **Global Settings** (tab).
3. Select either **Integrated graphics** (iGPU) or **High performance NVIDIA Processor** (dGPU) from the drop-down menu.
4. Click the **Setting** menu items to select any options required.
5. Click **Apply** to save the settings.

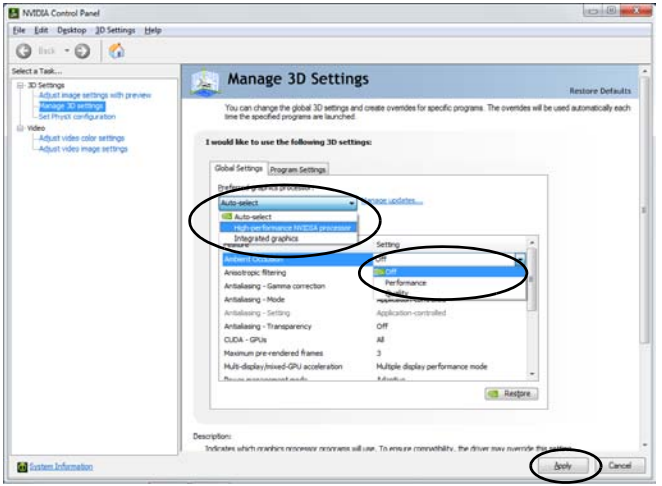


Figure C - 13
Global Settings

Program Settings

Program settings allows you to make specific adjustments for installed applications.

1. Run the **NVIDIA Control Panel** (see page ***C - 14***).
2. Click **Manage 3D Settings (3D Settings)** and select **Program Settings** (tab).
3. **Select a program to customize** from the drop-down menu, or click **Add** to add any program that does not appear in the menu.
4. **Select the preferred graphics processor for the program** from the drop-down menu**.**
5. Click the **Setting** menu items to select any options required.
6. Click **Apply** to save the settings.

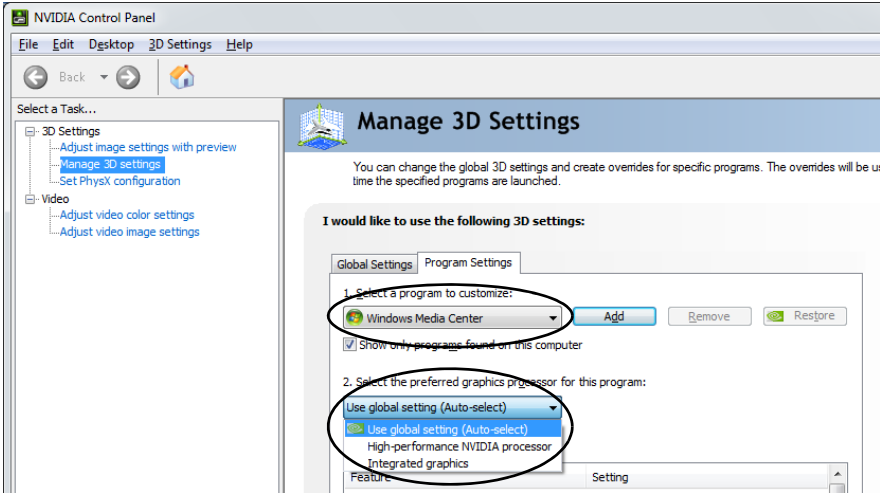


Figure C - 14
Program Settings

C

Set PhysX® Configuration

NVIDIA® PhysX® is a physics engine that can use the GPU to accelerate game and 3D application performance. You can select the GeForce video card or CPU as a PhysX® processor, or configure the computer to auto-select a PhysX® processor (recommended default setting).

1. Go to **NVIDIA Control Panel** (see page ***C - 14***).
2. Click **Set PhysX configuration**.
3. Click to **Select a PhysX processor** from the menu; Auto-select (recommended) is the default setting.
4. Click **Apply** to save the settings.

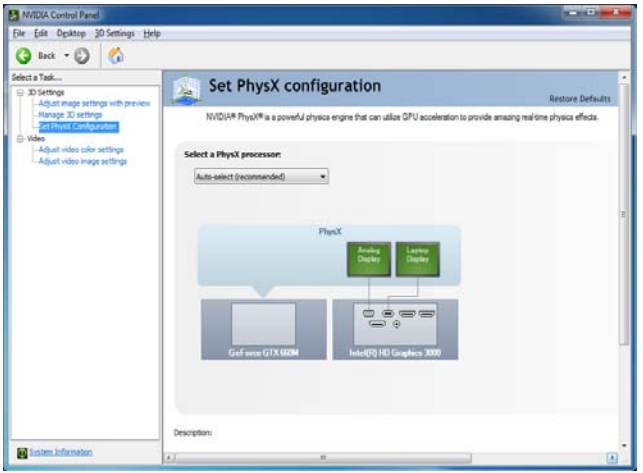
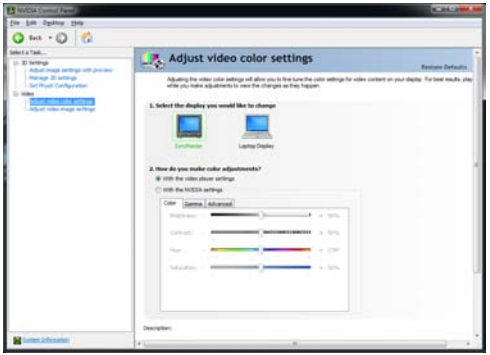


Figure C - 15
Set PhysX® Configuration

Video Settings

Click the sub-menus under **Video** to adjust the **video color** or **image settings**.



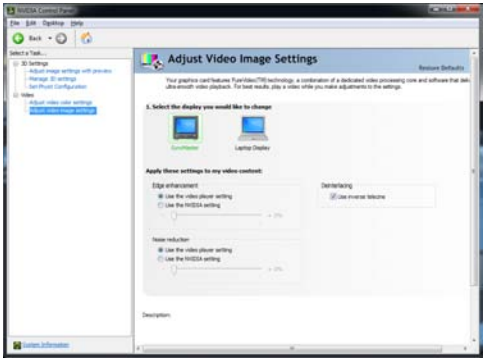


Figure C - 16
Video Settings

Volume Indicator

Click the taskbar volume indicator when an HDMI device is selected, and you will note that the icon at the top of the volume level indicator has changed.



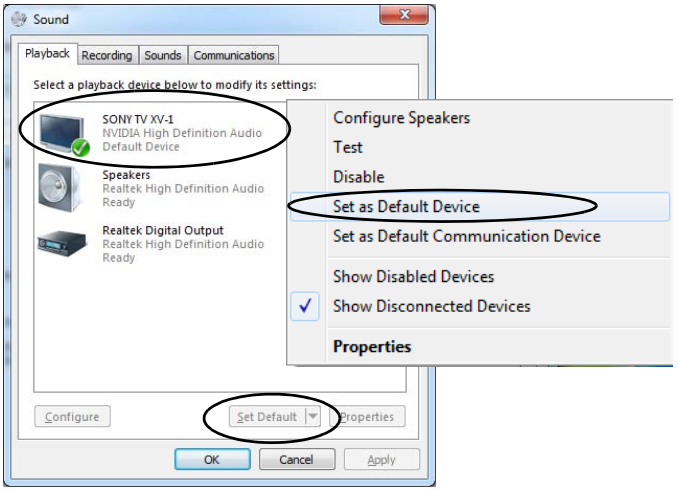
Figure C - 17

Sound - HDMI Device (set Default)

HDMI Audio Configuration

HDMI (High-Definition Multimedia Interface) carries both **audio** and video signals. In some cases it will be necessary to go to the **Sound** control panel and manually configure the HDMI audio output as per the instructions below.

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**).
2. Click **Sound** (**Hardware and Sound**) and click **Playback** (tab)
3. Depending on your display, the playback device may be selected, however in some cases you may need to select the audio device and click **Set Default** (button).
4. Double-click the device to access the control panel tabs illustrated overleaf.



5. Adjust the HDMI settings from the control panel tabs.
6. Click **OK** to close the **Sound** control panel.

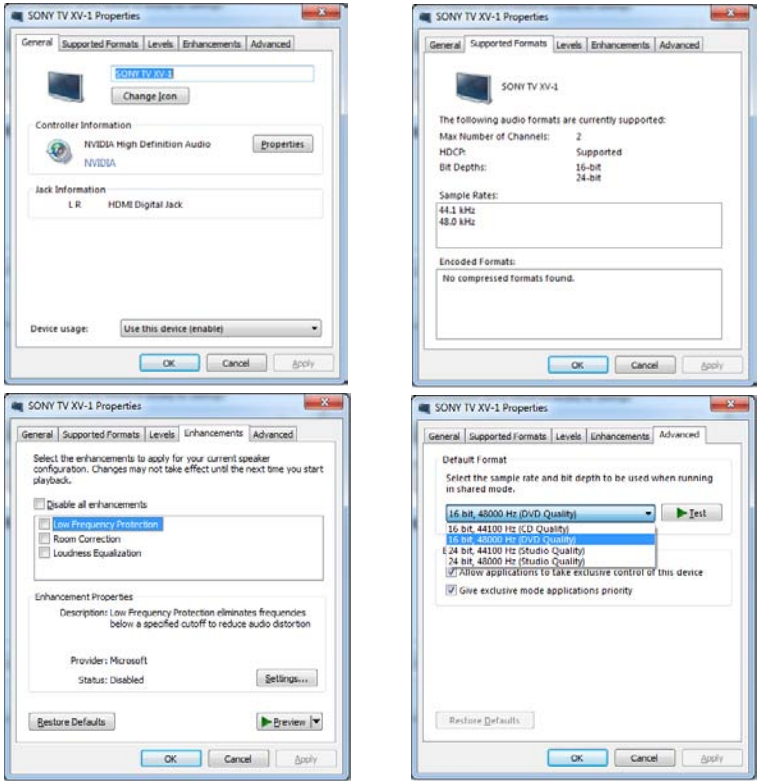


Figure C - 18
HDMI Device Properties

Other Applications

If you are using a third party application to play DVDs etc. from any attached DVD device, you will need to consult the application's documentation to see the appropriate audio configuration (the application must support digital to analog translation).

HDMI Notes

- Connect a device with HDMI support to the HDMI-Out port **BEFORE** attempting to play audio/video sources through the device.
- To play audio sources through your external display's (TV or LCD) speakers you will need to go to the audio configuration control panel on the display and configure the audio input accordingly (see your display device manual).

HDMI Video Configuration

1. Connect an HDMI cable from the HDMI-Out port to your external display.
2. Configure your external display as per the instructions in ***"Attaching Other Displays" on page C - 8***.
3. Set up your external display (TV or LCD) for HDMI input (see your display device manual).
4. You can now play video/audio sources through your external display.

THX TruStudio Pro & HDMI

1. When you connect an HDMI display to the HDMI-Out port, the THX TruStudio Pro controls will be disabled.
2. A warning box will pop-up and will prompt ***"Do you want to select another audio device now?"***.
3. Click **No** to continue using the HDMI audio output from your external display (do not attempt to select another audio device when connected to the external HDMI display.

Appendix D:Specifications



Latest Specification Information

The specifications listed in this Appendix are correct at the time of going to press. Certain items (particularly processor types/ speeds and CD/DVD device types) may be changed, updated or delayed due to the manufacturer's release schedule. Check with your service center for details.

Processor
Intel® Core i7-3820QM (2.7GHz) Quad-Core Mobile Processor 8M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-3720QM (2.6GHz) Quad-Core Mobile Processor 6M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-3610QM (2.3GHz) Quad-Core Mobile Processor 6M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-3520M (2.9GHz) Mobile Processor 4M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i5-3360M (2.8GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i5-3320M (2.6GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i5-3210M (2.5GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i3-3110M (2.4GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i7-2860QM (2.5GHz) Quad-Core Mobile Processor 8M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2820QM (2.3GHz) Quad-Core Mobile Processor 8M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2760QM (2.4GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2720QM (2.2GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2670QM (2.2GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 45W
Intel® Core i7-2630QM (2.0GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 45W

Intel® Core i7-2640M (2.8GHz) Mobile Processor
4M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i7-2620M (2.7GHz) Mobile Processor
4M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2540M (2.6GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2520M (2.5GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2450M (2.5GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2430M (2.4GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2410M (2.3GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2370M (2.4GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2350M (2.3GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2330M (2.2GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2310M (2.1GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Core Logic
Mobile Intel® HM77 Express Chipset
Memory
Dual Channel **DDRIII (DDR3)** ***Three 204 Pin SO-DIMM Sockets Supporting **DDRIII (DDR3) 1333/1600** MHz Memory Modules (*real operational frequency depends on the FSB of the processor*) ****Note: Three SO-DIMMs are only supported by Quad-Core CPUs; Dual-Core CPUs support two SO-DIMMs maximum* Memory Expandable up to 24GB Compatible with 2GB, 4GB or 8GB Modules
Display
17.3" (43.94cm) HD+ (1600 * 900) / FHD (1920 * 1080), 16:9 Backlit Panel

D

Video Adapter Options

Intel® Integrated GPU and NVIDIA® GeForce Video:

Supports NVIDIA® Optimus Switchable GPU Technology between iGPU and dGPU

Intel® HD Graphics 4000 / Intel® HD Graphics 3000 / Intel® HD Graphics (GPU Type Depends on Processor)
Dynamic Frequency
Intel® Dynamic Video Memory Technology Supporting Shared Memory up to 1.7GB
Intel® HD Graphics 4000 Supports Microsoft DirectX® 11.0
Intel® HD Graphics 3000 / Intel® HD Graphics Supports Microsoft DirectX® 10.0

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nVIDIA® GeForce GTX 660M PCIe * 8 Video Chip
2GB GDDR5 Video RAM On Board
Supports Microsoft DirectX® 11.0
HDMI
NVIDIA PhysX™
GeForce CUDA™ Technology
NVIDIA® Optimus™ 2012 Technology

Storage

One 12.7 mm Super Multi/Blu-Ray Combo/Blu-Ray Writer SATA Optical Device Drive (**Factory Option**)

Up to Two (**Factory Option**) Changeable 2.5" 9.5 mm (h) **SATA** (Serial) Hard Disks with RAID Level 0/1 Support

BIOS

One 48Mb SPI Flash ROM
AMI BIOS

Audio

High Definition Audio
S/PDIF Digital Output
Built-In Microphone
2 Built-In Speakers
THX TruStudio Pro

Keyboard & Pointing Device

Full Size Isolated Winkey Keyboard with Numeric Keypad
Built-In TouchPad (with Multi Gesture Functionality)
Three Instant Buttons; WLAN On/Off, Mute, Camera On/Off
GPU Mode Button (UMA/Optimus Mode)

Interface

One USB 2.0 Port
Three USB 3.0 Ports
One eSATA Port (SATA/USB 3.0 Combo)
One External Monitor Port
One HDMI™-Out (High-Definition Multimedia Interface) Port (with HDCP)
One Microphone-In Jack
One Headphone/Speaker-Out Jack
One S/PDIF Out Jack
One RJ-45 LAN Jack
One DC-In Jack

Slots

Mini-Card Slots for WLAN & Bluetooth Combo Half Mini-Card Module with PCIe and USB Interface

Card Reader

Embedded Multi-In-1 Push-Push Card Reader
- MMC / RSMMC
- SD / Mini SD / SDHC / SDXC
- MS / MS Pro / MS Duo

Note: Some of these cards require PC adapters that are usually supplied with the cards.

Communication

Built-In 10/100/1000Mb Base-TX Ethernet LAN

Intel® Centrino Ultimate-N 6300 3*3 (802.11 a/g/n) Half Mini-Card PCIe WLAN Module (**Factory Option**)

Intel® Centrino Advanced-N 6235 2*2 (802.11 a/g/n) Half Mini-Card PCIe WLAN + Bluetooth V4.0+HS Combo Module (**Factory Option**)

Intel® Centrino® Wireless-N 2230 2*2 (802.11 b/g/n) Half Mini-Card PCIe WLAN + Bluetooth V4.0+HS Combo Module (**Factory Option**)

(802.11b/g/n) Half Mini-Card PCIe WLAN + Bluetooth V4.0+LE Combo Module (**Factory Option**)

802.11b/g/n Half Mini-Card Module with PCIe Interface (**Factory Option**)

1.3M Pixel / 2.0M HD PC Video Camera Module (**Factory Option**)

Security

Security (Kensington® Type) Lock Slot
BIOS Password

Features

Painted Style
Intel® Anti-Theft Technology
Intel® Rapid Start Technology
Intel® Smart Response Technology

Power Management

Supports Wake on LAN
Supports Wake on USB

Power

Full Range AC/DC Adapter – AC in 100 - 240V, 50 - 60Hz DC Output 19V, 6.3A (**120 Watts**)

Removable 8 Cell Smart Lithium Ion Battery Pack 76.96WH

Environmental Spec
Temperature Operating: 5°C - 35°C Non-Operating: -20°C - 60°C Relative Humidity Operating: 20% - 80% Non-Operating: 10% - 90%
Physical Dimensions & Weight
413mm (w) * 277.5mm (d) * 17.1 - 44mm (h) 3.2kg with ODD and Battery